THE IRON AGE

New York, August 12, 1926

ESTABLISHED 1855

VOL. 118, No. 7

Welded Joints Searched by X-Rays

Defects Which Can Be Detected and Some Which Cannot—Methods of Making and Testing Welds—Typical Radiographs

BY JOHN T. NORTON*

THE radiographic method of studying welded joints is briefly described in this article and its possibilities discussed. The various types of defects common to welds are illustrated by radiographs and the limitations of the method considered as well as the advantages. It is concluded that, although it does not give complete information about the joint, it is a practical and worthwhile method of examination.

THE part played by welding processes in the multitude of fabricated structures made of metal is a very important one. This importance is being emphasized as more and more uses are being developed. Examples of such applications, where gas and electric methods have completely revolutionized well-known processes and made possible entirely new ones, are familiar to everyone.

As these methods and their application are developed the question arises as to the value of articles made in this way as compared with those made by other methods and as to just how far the welded joints

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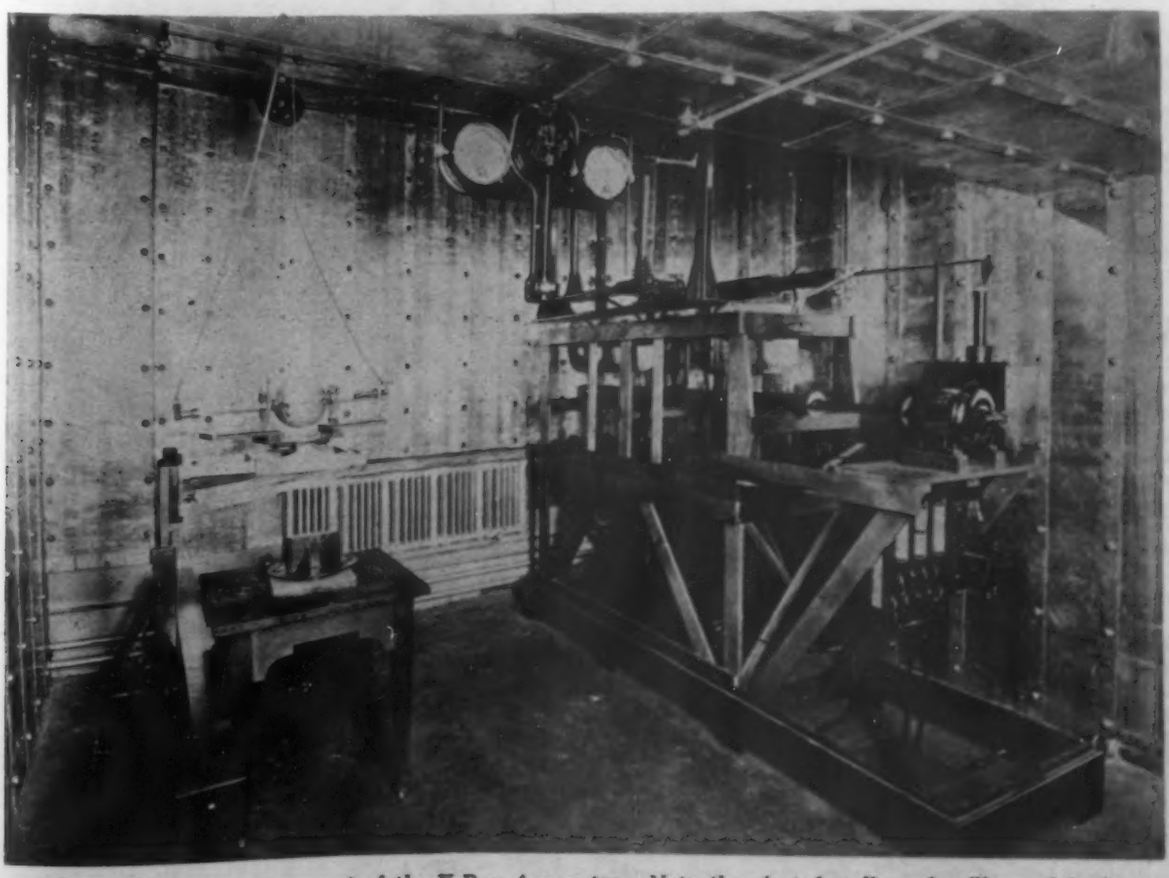


Fig. 1—General Arrangement of the X-Ray Apparatus. Note the riveted walls and ceilings of lead

Fig. 2

Fig. 3

may be depended upon. In order to answer such questions, it is necessary to subject the welds to tests which will indicate their fitness for the particular purpose. Many such tests have been devised.

It is the purpose of this paper to describe briefly one of the newer methods of examining welds, a method which has been used with considerable success in other directions, and to show its possibilities and limitations in this particular field.

Welding Methods in General

Fusion welding is a very common method of joining metal parts. The process consists in bringing the two parts to be joined close together and filling the space between with molten metal in such a way that it fuses with the base material on both sides and forms a strong, continuous joint. The welding material used for joining the parts is usually applied in the form of a rod which is melted and, to prevent it from oxidizing at this very high temperature, some sort of a low melting point slag is sometimes applied to cover the surface.

The high temperature necessary for melting the welding material and for heating the base metal surfaces so that the welding material will unite is obtained in two general ways. The first is known as gas welding and employs some sort of a torch which burns an inflammable gas such as hydrogen, or more often acetylene, together with oxygen in the form of a very small intense flame. The other method makes use of an electric arc, struck either between two carbon rods, a carbon rod and the base metal, or between the base metal and a rod of the welding material. Each of these methods has its particular field of application and its enthusiastic exponents, but it is not necessary to discuss their relative merits here.

A welded joint of this sort may, and usually does, have any of a number of typical defects. In the first place, because of the nature of the welding process, the joint will have the characteristics of cast material, which is usually not the best condition of a metal as far as physical properties are concerned. This condition may be improved by proper heat treatment. In addition there are a number of other gross defects which cannot be improved, once the welding material has solidified.

These defects are gas pockets, slag inclusions, oxide inclusions, lack of fusion, layers, seams and cracks, all of which tend to weaken the joint. Gas pockets are due to the trapping of gases of various kinds, as the metal hardens, which come from the welding flame or from the oxidizable impurities in the metal. The slag used to prevent oxidation often becomes mixed with the molten metal and is retained on solidification, resulting in an inclusion which has very little strength. Frequently, due to a thin layer of oxide on the surface or to insufficient heating, the welding material does not adhere to the base metal or in some cases does not even fill up the space between the two base metal surfaces, with a resulting weakness of the joint. Layers and seams in the welding material are due to thin oxide layers and improper fusion.

Because of the very great differences in temperature between different parts of the weld, considerable stresses are introduced on cooling which may be sufficient to pull the welding material apart, causing a shrinkage crack. All of these defects result in a weakening of the joint and are particularly troublesome, because they seldom are visible on the surface.

Methods of Testing Welds

Such defects are quite common in welds but, because an indifferent or careless workman can make a weld which looks satisfactory on the surface, testing is necessary. There are several methods for such testing and perhaps the most useful is the tensile test. In this case the joint is loaded in a fashion similar to that which it will meet in practice and the actual point of failure determined. The method is useful in studying welding methods but of course cannot be applied to a particular sample which is to be used.

Another method is to take a section of the joint, polish it roughly and etch it with a suitable solution for macroscopic examination. This shows very clearly such defects as have been mentioned above, if they happen to be on the particular section taken. Also a microscopic examination of these sections often yields much useful information. However, these are all open to the same objection; they destroy the usefulness of the joint in the examining process.

Another method, known as radiography, which has been used with considerable success for studying castings and forgings, has also been applied to welds of various kinds, and it appears to have some very worthwhile possibilities. The method employs the great penetrating power of X-rays to render visible the in-

Fig. 4

Fig. 5

terior structure of the weld. The author is familiar with the previous work which has been done in this connection, but it is his purpose to consider the practicability of the method rather than any particular characteristics of welding.

How X-Rays Function on Metals

X-radiation, which is like light of very short wavelength, possesses the property of passing through bodies ordinarily considered opaque without much loss in intensity. This penetrating power depends upon the quality of the radiation and upon the density and thickness of the material which is being penetrated. The radiation also will blacken a photographic plate so that a record of its intensity may be obtained. So, if a beam of X-rays is passed through a body and a photographic plate is placed immediately behind it, a sort of shadow picture will result, the light or thin spots in the object corresponding to black areas on the plate and the dense or thick spots showing light. In this way a very complete picture of the gross interior structure of the body may be obtained.

The X-rays are produced by an X-ray tube and a high-voltage generator. The penetrating power of the beam increases with the voltage and, for 3 in. of steel, a potential of about 250,000 volts is necessary. The intensity of the beam is determined by the current flowing through the tube, and it is customary to measure exposures as a product of the tube current and time. Fig. 1 shows the general arrangement of the apparatus, and reference to the pictures of some of the welds will indicate what surprisingly fine detail can be obtained in this way even in quite large thicknesses of material.

The technique of making radiographs is usually quite simple, chiefly because thicknesses of less than 1 in. of metal are the most common. The time of exposure for steel plate 1 in. thick is about 5 min., and for plate ¼ in. thick, about 30 sec. In radiographing welds in thin plate, where the surface irregularities of the welding material are comparable with the thickness of the plate, it is sometimes necessary to smooth up the surface by chipping or grinding. If, however, the condition is understood when viewing the finished picture, this procedure is not always necessary.

Typical Radiographs of Welds

Following are some typical radiographs of welds which show very plainly the appearance of defects as revealed by X-ray.

Fig. 6

Fig. 7

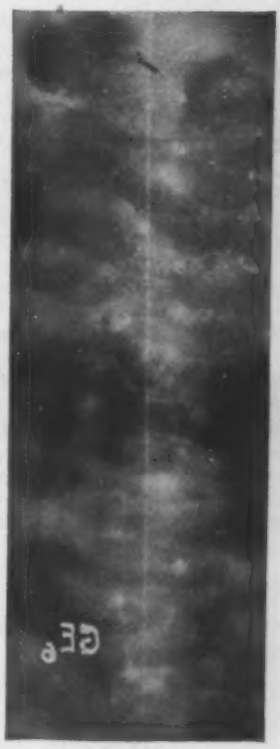


Fig. 8

Fig. 9

Fig. 2 is the radiograph of a good oxy-acetylene weld in steel plate. The weld is of the single V-type and the plate is 1 in. thick. According to the radiograph, this is a satisfactory, sound weld which should give good service. There are no evidences of gas pockets, slag inclusions, oxide or lack of joining of the plates. The mottled appearance of the blackening is due to irregularities in the surface of the welding material.

Contrast this with Fig. 3, which is quite evidently a poor weld. This is a double V electric arc weld in 1-in. steel plate. It contains many inclusions of gas, and there is a definite lack of fusion between the plates in the center. It is interesting to note how plainly even minute holes show up.

Fig. 4 is another typical example of the appearance of gas pockets in welds and is an arc weld in 1-in. plate. This and Fig. 3 were made with an atmosphere of hydrogen to prevent oxidation and some of this hydrogen, which is very soluble in the molten metal, has been retained in small globules as the metal solidified. The weld is much less brittle because of the removal of the oxide, but the cross-sectional area of sound metal is also much reduced by the presence of the gas bubbles. Fig. 5 is an example of the appearance of gas pockets in a gas weld. In this case, the plate is only ¼ in. thick.

Gas pockets have in general a more or less spherical shape and, since the gas is more transparent than a corresponding thickness of metal, they appear as dark spots on the negative or light spots on the print. In the same way, inclusions of slag or oxide are more transparent than the metal and appear as light areas on the print, but they do not have the smooth, rounded outlines which are characteristic of the gas pockets. They are usually irregular in shape and sometimes appear as long lines or streaks. Fig. 6 shows such inclusions very plainly and indicates how readily they are distinguishable from gas pockets. Fig. 4 also shows some slag inclusions.

Layers of oxide separating the base metal and the welding material and also different portions of the welding material are sometimes quite plainly seen, as in Fig. 6, and more clearly in Fig. 7. However, unless the layer is approximately parallel to the direction of the X-ray beam, it will not show, as was plainly indi-

cated when the weld of Fig. 6 was cut up into thin sections.

Lack of fusion, or flow of welding material between the plates, is indicated on the print by a white line, and this is quite evident in Figs. 6 and 8. The latter also shows the effect of piling up the welding material on top of the joint.

Shrinkage cracks in welds are particularly troublesome when they exist in welded joints, but they do not often occur. A radiograph will show them distinctly if they are nearly parallel to the X-ray beam. None have been found in any of the welds examined in the course of this investigation. A gas pocket or similar defect of a certain size will show much more plainly on the radiograph of a thin specimen than in the case of a thick one. This is evident on a comparison of Fig. 5, which is ¼ in. thick, and Fig. 9, which is 2½ in. thick. However, the minimum size of hole which can be detected does not increase so fast as the thickness, and it has been shown experimentally that it is much easier to detect a hole, whose diameter is 5 per cent of the thickness of the sample, in a thick sample than in a thin one.

Defects Not Shown by X-Rays

As contrasted with the sort of defect that the X-ray method will show, there are a number whose presence it will not indicate. Of course a radiograph will tell nothing of crystalline condition of the weld and the surrounding metal. There are X-ray methods which will do this, but they cannot be discussed here, and they are probably not so satisfactory in most cases as a microscopic examination. The radiograph also will not show cracks, seams and layers of oxide which are nearly normal to the direction of the X-ray beam, and the latter defects are commonly present, as was indicated when several of the welds were sectioned.

In practically every case, however, where a weld was seriously defective in this manner in a plane normal to the X-ray beam, there were also similar defects arranged in a direction parallel to the beam which did show plainly. Furthermore, if the welding material and the base are in intimate contact but not actually fused together, the radiograph will not show the lack of fusion. Only when there is an appreciable space between the two will it be evident.

The method is limited, due to the equipment at present available, to thicknesses of about 2 in. for brass or bronze, 3 to 3½ in. for steel, and about 5 to 6 in. for aluminum or duralumin. Within these thickness limits are included practically all commercial welding jobs.

General Conclusions

These considerations may be generalized briefly as follows:

1. The radiographic method will definitely show in the case of welded joints inclusions of gas, slag, oxide or other impurities whose thickness in a direction parallel to the X-ray beam is more than 5 per cent of the total thickness of the sample.
2. This method of examination will show the presence of cracks or seams which are nearly parallel to the direction of the X-ray beam.
3. The method will indicate the failure of the welding material to join completely the base metal plates.
4. The method will not show cracks or layers which are normal to the X-ray beam.
5. The method will not tell anything about the crystalline condition of the metal.

As a result of these considerations, it seems that this method should be useful for the examination of welds in many cases. Because of its expense, it cannot be at present applied to the routine inspection of an article in quantity production. But there are many examples of the development of new processes and of articles on which no expense should be spared which would tend to prevent failure, where the method should prove valuable. No amount of inspection can take the place of careful and thorough workmen and nowhere is this more true than in the welding industry, but even when the workman has done his best under the most favorable conditions, there is the ever-present doubt which the penetrating eye of the X-ray beam will do much to set at rest.

In conclusion, the writer wishes to acknowledge the assistance of R. D. Carlson and W. C. McClure, who were associated with him in this work, and to express his appreciation to the various companies who so kindly prepared the welding joints.

Unveiling of Statue to the Steel Industry of America at Sesqui-Centennial Exposition Last Week

J. & L. Statue Unveiled at Sesqui-Centennial Exposition

"Steel," the heroic sized group of sculpture donated by the Jones & Laughlin Steel Corporation to the city of Philadelphia and the Sesqui-Centennial Exposition, was unveiled on Aug. 4. The statue was presented by B. F. Jones, 3rd, secretary Jones & Laughlin Steel Corporation, whose address was in part as follows:

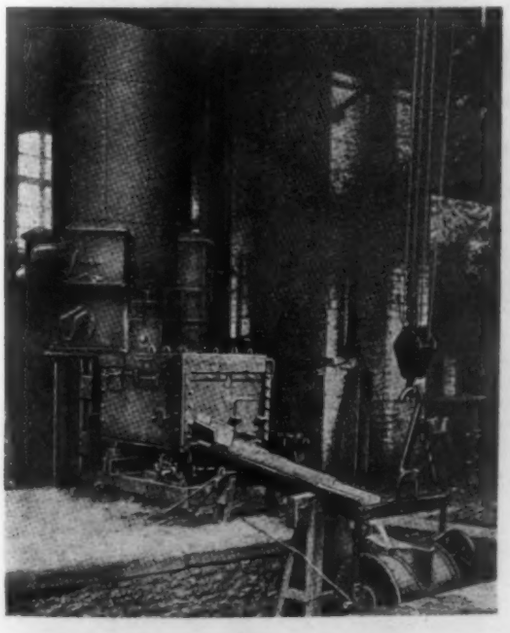
"It is fitting that the steel industry should be memorialized upon the occasion of celebrating 150 years of American independence, because so much of the amazing progress made in that period by this young nation can be attributed to steel. Without steel, America would never have been the parent of modern railroad transportation that has linked our far-flung States into a closely related Union. But for steel those swift couriers, the telegraph and telephone, would have been impossible. Steel has developed the automobile, the ocean grayhound, the airplane. To steel we are indebted for the high-speed printing press, which enables our people daily, almost hourly, to know what the nation and the world are doing and thinking. Steel goes with us in every gesture of work and play. Steel frames our offices, our schools, hotels, hospitals and farm buildings. Without steel American agriculture would still be plowing with a crooked stick behind oxen instead of using gang plows drawn by tractors that turn many rows of furrows in rapid progress around vast fields. Steel harvests our grain, bears it to mill and market, grinds it into flour, and brings us our daily bread in rapid transit, fresh from the huge steel ovens of the modern baking plant."

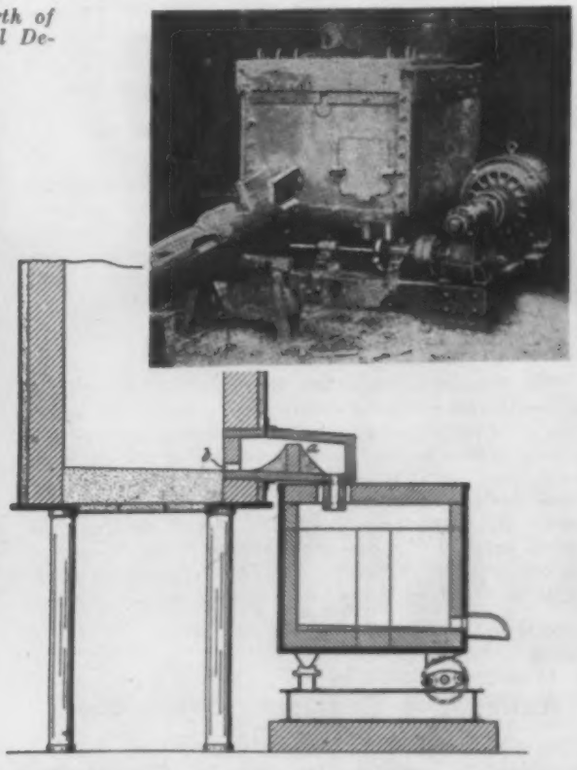
Jolting Iron to Desulphurize It*

Special German Apparatus Agitates the Metal in the Forehearth—Sulphur in Iron Lowered as Much as 55 Per Cent—Benefits Semi-Steel and Steel Castings

AT the annual meeting of the Austrian Metallurgical Society, held at Loeben, May 15 to 17, and reported upon by Carl Irresberger for *Stahl und Eisen* (June 30, 1926), Dr. Joseph Dechesne presented his practical development of an old observation—that in the transportation of blast furnace metal some distance, the jolting, incident thereto, has a desulphurizing effect. This jolting action, as he understands it, is twofold and consists of the vertical, upward, central jolt which is valuable in liberating dissolved gases; and the eccentric, or shaking, jolt which forms wavelets and thus aids in thorough mixing of the metal. That sulphur is thus removed in the transit of molten metal from the blast furnace is proved by the sharp smell of sulphur dioxide accompanying this, as also by analytical determinations made of the metal itself.

The Jolting Is Done in the Forehearth of a German Cupola by the Mechanical Devices Here Reproduced





Two Theories Offered

There are two theories to explain this occurrence: One, that of the jolting action referred to, and the other that manganese sulphide is separated out. Probably both of them are right, it being easy to see that a comparatively slow action on the part of any manganese sulphide formed in going upward would be much hastened, were the metal thoroughly jolted. Sulphur is combined with iron and manganese in the form of simple sulphides. Since manganese has the greater affinity for sulphur, it would tend to be satisfied first, only surplus sulphur going to the iron. Since manganese sulphide has a specific gravity of 3.6 to 4.0, and melts at about 2900 deg. Fahr., and the temperature of the molten iron would not be much over 2550 deg. Fahr., the former will have solidified and, from its lightness, risen to the surface little by little or until progressive cooling has made the metal sluggish. Any jolting applied under these conditions cannot but accelerate the removal of manganese sulphide to the surface of the ladle, where contact with the air burns it in accordance with the following reaction:

$$MnS + 3O = MnO + SO_2$$

Manganese oxide goes into the slag, while sulphur dioxide is dissipated into the atmosphere. A series of tests indicated that desulphurization up to 55 per cent was accomplished, the sulphur content just under the surface of the metal rising to 0.50 per cent. Without doubt even better results would have been obtained had the cooling of the metal been prolonged artificially. There are, however, other advantages to be gained by this jolting process.

Effect of Super-Heat

Recent developments in improving molten iron for foundry purposes indicate that this depends upon obtaining a high degree of super-heat as the metal leaves cupola or furnace, and in prolonging the retention of this heat as much as possible either before or after pouring the molds. Piwowarsky, who belongs to the more recent school of investigators of cast iron, holds that every blast furnace or cupola iron has a given critical temperature, depending upon its composition, above which critical temperature it has an accelerating tendency to set as a high-grade gray iron.

Setting as gray iron results from two parallel proc-

*Abstract and comments by Dr. Richard Moldenke, Watchung, N. J.

esses: The solution at these high super-heat temperatures of particles of graphite otherwise remaining at ordinary melting temperatures and forming nests of very coarse graphite crystals in the solidified metal, and the breaking up of the molecules of iron carbide. Jolting the molten metal under conditions of a high degree of super-heat should facilitate this solution of residual graphite in the metal and make the subsequent breaking down of the iron carbide a uniform process. This is proved by the microstructure of the resulting cast iron, which is pearlitic with eutectic graphite in the main.

Advantages When Scrap Steel Is Used

Doctor Dechesne also claims great advantages for the process when much scrap steel is added to the cupola mixture, holding that the jolting action prevents quick setting, with its accompanying disadvantages of heavy shrinkages and chilling to white iron. He admits that this part of the program is still rather nebulous, but cites the following physical strength figures as obtained with jolted metal with 1.6 to 2.6 per cent silicon, and 3.2 to 3.6 per cent total carbon, with normal pouring temperatures of 2450 to 2550 deg. Fahr.:

> Test bars 1.2 in. diameter gave a tensile strength of 42,700 to 56,900 lb. per sq. in. When such test bars were placed upon supports 24 in. apart and broken transversely, the deflection ran up to 0.6 in. (which is very high when compared with the results obtained on similar test bars of American cast iron). Brinell hardness ran from 180 to 240—all the above figures relating to both green and dry-sand work.

Jolted metal poured into even the thinnest castings, such as the ribs of motorcycle cylinders, came out perfectly gray in fracture and easily attacked by the file. Again, the process also did much good to molten steel, removing the contained gases in great measure and giving fewer blow holes in the resulting castings.

How the Jolting Is Applied

The illustrations indicate the manner of applying a jolting system to the forehearth of a cupola—for American conditions the application would be to a tilting mixing ladle—jolting being done during the tapping period and continued until ready to transfer into the crane ladles. The section of cupola and forehearth shows the arrangement of the power device. The hearth consists of a cast steel bottom plate, the rest of the box being of cast iron. The front edge of the apparatus is lifted by a cam device, to a height of about 1½ in. and at the rate of 100 jolts per min. as the best speed. A 5-hp. motor operates the device.

No attempt is made to make a tight joint between cupola spout and forehearth, and the latter, previously heated up, is brought to about 2200 deg. Fahr. by means of the cupola gases directed through the breast when the blast is put on, and allowed to follow their regular course up the cupola only when the molten iron begins to appear. There are special devices for accomplishing this process. The operation of the jolting device is left to the cupola tender, who simply has to start and stop it by the usual motor switch. Current expense is given at ¾ to 1¼c. per ton of jolted molten metal. There is no loss of time or other expense attached to the proceeding, and it is recommended for gray iron, malleable, and steel casting foundry purposes.

General Comment

This application of the unavoidable jolting incident to the transportation of blast furnace metal between furnace and open-hearth or Bessemer plants to the beneficiation of molten foundry metal is of special interest to the metallurgist and foundryman alike. It is well known that molten iron will lose much of its sulphur, if allowed to stand quietly for a time—provided the high-sulphur surface metal and slag can be removed from the ladle satisfactorily. It is also known that blowing a small stream of air into the bottom of a ladle full of molten iron, by pushing the compressed air pipe down into it, will remove half the sulphur content in a few minutes, provided you can get it away by skimming. Prince did this many years ago. But these occurrences are not dependable for regular use. Hence a systematic movement of the metal by jolting under predetermined optimum conditions should be of special interest by way of desulphurization as compared with the chemical method now being introduced in the foundry world.

For the metallurgist, the theory of Piwowarsky of graphite nuclei undissolved in ordinary molten iron, but disappearing when highly superheated, will give rise to considerable thought; as also another theory, advanced by Profesor Goerens, of Krupp at Essen, who holds that, depending upon the degree of superheat of the molten metal, there are nuclei of iron carbide crystals which have a great influence upon the final structure of the casting, so that it is decidedly advisable to start with intensely hot metal with all these chances for starting points of bad spots wiped out, rather than melting cold. The foundryman is fully aware of the fact that melting very hot always gives the best results, but did not know just why.

Automotive Engineers to Join Steel Treaters at Chicago

During the annual convention and national steel exposition to be held in Chicago the week of Sept. 20 by the American Society for Steel Treating, the production meeting of the Society of Automotive Engineers, with headquarters at Hotel Sherman, will be in session on Tuesday, Wednesday and Thursday, Sept. 21, 22 and 23. There will be four technical sessions. Among the subjects to be discussed are the following:

Two papers will be presented at the conveyor session, each dealing with the design, installation and application of conveyors. Paul Phelps and N. H. Preble, of Mechanical Handling Systems, Inc., are the authors of one of the papers; the other is being prepared by Clarence A. Brock, of the Miller-Hurst Co.

"Inspection Along the Line" is the subject upon which A. H. Frauenthal, of the Chandler Motor Car Co., will speak at the inspection session. The latter portion of this session will comprise a symposium at which several inspection men will talk about unknown or little-known inspection gages that have proved helpful. The men participating will include A. R. Fors, of the Continental Motors Corporation; P. W. Rhame, of the A. C. Spark Plug Co.; J. B. Scott, of the Yellow Sleeve Valve Engine Works, Inc.; C. S. Stark, of the Packard Motor Car Co., and R. R. Todd, of the Oakland Motor Car Co.

"What Goes Wrong with Machine Tools" will be the important question discussed at the machine tool session by E. R. Stoddard of the Studebaker Corporation of America. O. C. Kayle, consulting engineer, Syracuse, N. Y., will give information on "Fitting the Tool to the Job." The gear production session will include two papers, one by John Bethune and Walter Hildorf, both of the Reo Motor Car Co., and one by Charles L. Cameron, of the Gould & Eberhardt Co.

Arrangements have been made for inspection trips to the Kenosha plant of the Nash Motor Car Co. and to the International Harvester Co. A cordial invitation has also been received from the Yellow Truck & Coach Mfg. Co., affording the members an opportunity to visit its plant.

Weekly earnings in factories in New York (State) are reported by the Industrial Commissioner to have averaged $28.99 in June, being 128 per cent higher than in June, 1914. Except for December, 1925, and January and March, 1926, all of which showed $29.03 to $29.05, the June figures are the highest ever recorded. They exceed the maximum of 1920 (October) by 6c.

Determining Carbon in Cast Iron

Simplified Combustion Train Found Satisfactory for Routine Analyses in Laboratory of Large Cast Iron Pipe Foundry

BY J. T. MACKENZIE*

THE modified form of carbon combustion train, shown in the illustration, has been used in the laboratory of the American Cast Iron Pipe Co., Birmingham, for some time and has been the most satisfactory of the many trains tried for routine work on cast iron. It is assembled with standard equipment, except for the very excellent chromic-sulphuric acid bulb. This is now available in Pyrex glass and it is carried in stock by Doster-Northington, Inc., Birmingham. It was made from sketch, by the writer, after seeing the bulb in operation in the ferrous metals laboratory of the United States Bureau of Standards.

The oxygen is controlled with an ordinary welding gage (60 lb.). The cutting gage (200 lb.) is not so sensitive. The Johnson tower "A" is filled halfway with coarse (4 mesh) moist (15 per cent) soda lime. A layer of asbestos is put in and the top of the tower packed with medium (12 mesh) dry (2 per cent) soda lime. Ascarite may be used throughout but it is more expensive. A "Y" tube may be inserted here for a pressure indicator or a sulphuric acid bottle may be put in as a further drier, or as a "bubbler," but neither is necessary.

Any combustion furnace may be used, but the larger bore—1⅝ in.—is more useful. The tube is plain end at the entrance with a constricted exit for slip over rubber tube connection. The alundum thimble at "B" keeps the rubber stopper perfectly cool even in silica tubes, and the thimble at "E," packed with asbestos, serves as a "stop" for the boat and as a heat storage without clogging, which an asbestos packing is prone to do. The copper gauze "E," just beyond the red heat range, serves as catalyst in case any monoxide is escaping oxidation. Glazed silica tubes have been found much superior to unglazed, but neither lasts as well as fine porcelain, such as McDanel, though they lend themselves more readily to quick changes in case of a burnt-out furnace. Tubes not less than ⅞ in. bore give much better service than smaller tubes but there is no advantage in larger diameter than 1 in. The tube with constricted end can be used with exit end much closer to the furnace than the plain end tube, for the rubber is not so much exposed to the heat.

The chromic-sulphuric acid bulb "G" is held upright by a clamp. The left hand bulb is packed loosely with glass wool or asbestos, and the right is about two-thirds full of glass beads. The top bulb, with glass stopper, allows a fresh undiluted reservoir of the mixture to be kept always available and the two stop cocks allow easy and rapid changing of the solution as soon as its green tint begins to indicate exhaustion or, if experience indicates, at the end of every fixed number of runs.

The absorption of sulphur is practically complete in this solution (concentrated sulphuric acid saturated with chromic acid), the sulphur dioxide being oxidized to trioxide and absorbed while the chromic acid is reduced to the green chromous compound. The capacity of the left hand bulb is such that, in case of a "kick back," none of the acid will get into the tubes behind. Another great advantage is that the resistance is very small as compared to zinc and phosphoric anhydride, so the pressure is kept low and leakage avoided.

The Fleming bulb is used, packed with ascarite (bottom) and phosphoric anhydride (top). The author prefers the two-piece bulb, for one packing of the top will usually take care of three bottom fillings. The ascarite becomes very hard and it is difficult to remove from the one-piece bulb but the two-piece causes very little trouble. The Nesbitt bulb was used for some time without the phosphoric anhydride but several lots of ascarite seemed to lose a great deal of moisture, so the Fleming was adopted with the double pack, as very little more trouble and much safer. The phosphoric anhydride can, of course, be packed over the ascarite in a Nesbitt bulb but the double-bulb Fleming is much more suitable. A guard tube is useful in observing the rate of flow of the oxygen and, if filled with barium hydrate solution, the ascarite may be used to its limit without hesitation.

For very exact work, where the difference in drying power of sulphuric acid and phosphoric anhydride might be a factor, a Fleming phosphorus tower, packed very lightly, may be introduced after the chromic-sulphuric bulb and will last a long time, as it has very little work to do.

The writer uses ferric oxide (B and A red powder) ignited in his own laboratory for 6 hr. at 950 deg. and sifted through a 20-mesh sieve. The Johnson clay boat is lined with oxide and the sample put into the boat as found best for the particular material. Sometimes, with high-silicon cast iron, ingot iron is added to assist, but usually the iron oxide is sufficient—most of it fusing with the sample. Cast iron can be burned at from 50 to 100 deg. lower temperature on a good oxide bed than on one of alundum. Some oxides, especially the brown, granular ones, seem to be of no assistance whatever.

For graphite, the crucible (G 5) is most excellent. A very thin layer of asbestos is sufficient to retain the

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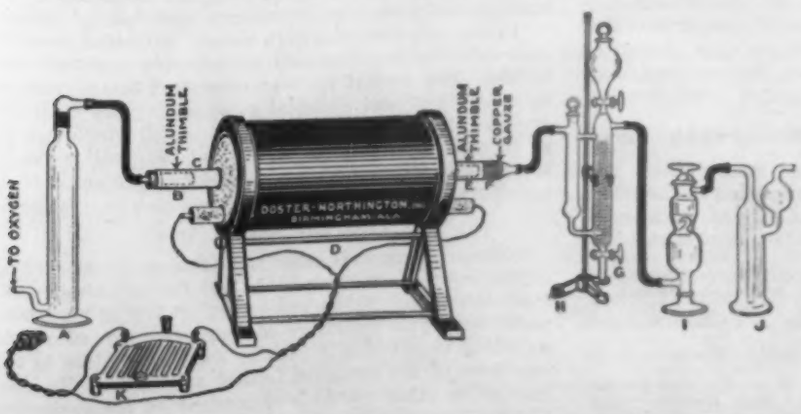

Arrangement of the Simplified Combustion Train as Developed in the Laboratory of an Alabama Pipe Foundry

graphite and, with cast iron, a few drops of hydrofluoric acid may be added to insure non-interference of gelatinous silica, especially on samples resistant to nitric acid. It attacks the crucible very little, if used cautiously. The large crucibles (⅞ in.) are much more convenient than the small ones but demand a full inch in the bore of the tube, though 1⅛ in. is safer. Either can easily be lifted out with a stiff bronze or steel wire, slightly bent at the end.

The advantages may be summed up as follows:

1.—Low pressure, with consequent freedom from leakage.

2.—Simplicity.—Few parts to set up and keep in stock.

3.—Ease of maintenance.—The chromic-sulphuric bulb is kept fresh and the front tower lasts a long time. The author has run 2000 carbons, averaging 3.5 per cent, without changing anything but the Fleming bulb.

4.—Accuracy.—This train is fully as accurate as the more complicated set-ups. In the hands of the routine man, it is more accurate, for there is so much less chance for trouble. In routine work, much work is lost before a small leak is discovered, and the more joints there are, the longer it takes to find it afterward. Consequently, every move toward simplicity is a step toward accuracy so long as a few fundamental conditions are complied with. (A.S.T.M. Standards 1924—page 260.)

I wish to thank H. A. Bright and J. I. Hoffman of the United States Bureau of Standards for the chromic sulphuric bulb and other helpful ideas. Also Max Kuniansky, chief chemist Lynchburg Foundry Co., for the suggestion of the iron oxide.

Chromium Alloys Resist Chemicals*

Use in Chemical Apparatus—How Chromium Acts in Creating Resistivity—Proper Precautions in Welding

BY C. E. MAC QUIGG

THE field of alloying presents almost unlimited possibilities [in resistance to corrosion] and is being rapidly developed. Metals, which are not by themselves immune to attack when alloyed in a proper manner, are quite satisfactorily resistant. The general principles of chemical stability are hardly more than glimpsed in our present knowledge of alloys, but some general considerations may be noticed.

Grouping Metals as to Resistance

Metals (and alloys) may be divided into two main groups according to whether they owe their resistance to corroding influences to:

(1) low electrode potentials or solution pressures, or
(2) the formation of a protective coating, formed by the product of the corrosive action itself.

The first named effect will readily be recognized as due to the relative position of the material in the electrochemical series, as platinum, gold, silver, copper, lead, nickel, cobalt, iron, zinc, manganese, aluminum and magnesium, mentioned in the descending scale of general resistivity, or expressed differently, in their ascending tendency to go into solution in electrolytes.

The second effect will be a function of the nature of the film or product of the reaction. For example, although aluminum has a very high solution pressure, and thus an enormous tendency to go into solution, it is actually quite insoluble in nitric acid, because the very thin protective coating of more or less hydrated aluminum oxide, which is instantly formed, successfully resists further oxidation of the subjacent metal.

From the list of pure metals at present commercially feasible and having physical properties that make them amenable to fabrication, we must choose the following: iron, nickel, aluminum, copper, lead, zinc or tin.[1]

Resistivity a Function of Metallographic Parts

With the somewhat restricted possibilities seen above, the outlook is much more promising in the direction of the alloy field. The resistivity of an alloy to corroding action is a function of the properties of its metallographic constituents; these may be either pure metals, solid solutions, definite chemical compounds, or their mixtures. The interrelation of chemical resistivity and structural constitution has not yet been the subject of more than a cursory investigation, but it seems safe to say that this study affords greater means of advance than any other, since more information of an indicative nature will be discovered by a correlation of metal structures with chemical properties, than any other means.[2]

Alloys are loosely classified into ferrous and non-ferrous, depending on whether or not the base is metallic iron. While this classification was formerly more satisfactory, because formerly nothing but iron or steel had properties such as amenability to heat treatment and certain features of microstructure, such is not now the case because some non-ferrous alloys have properties very similar to steel. Ferrous alloys are particularly subject to attack by acid or oxidizing agents. On the other hand they have those desirable attributes of workability and strength and, in addition, they are the cheapest.

Effort has been directed in the rather recent past toward alloying with iron some element or elements which would enhance its chemical stability without sacrifice of physical properties and undue increase in cost. Numerous elements were and are being tried, such as nickel, molybdenum, copper, cobalt, tungsten, titanium, manganese, vanadium, silicon, both singly and in combination. None has shown the results that have been obtained singly by chromium. Very desirable effects are also achieved with the chromium-nickel combination with iron, sometimes modified by silicon.

In the non-ferrous group almost unlimited possibilities exist for the discovery of corrosion resistant materials. The control by heat treatment of the various solid solutions and chemical compounds with their respective effects on physical and chemical properties all go to make probable the belief that here will occur in the next generation some outstanding achievements of metallurgy.

How Chromium Acts

Chromium imparts oxidation resistance to the ferrous alloys and this condition holds true for oxidizing conditions in general, either wet or dry, at low or high temperatures. The resistance of the element chromium and its alloys to chemical attack by solutions resides in the inertness of the products formed and held on the surface or in other words is dependent on the protective film.

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*From a paper, "Chromium Alloys in Chemical Plant Apparatus," delivered at convention of American Institute of Chemical Engineers at Berlin, N. H., June 21, 1926. The author is metallurgist Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

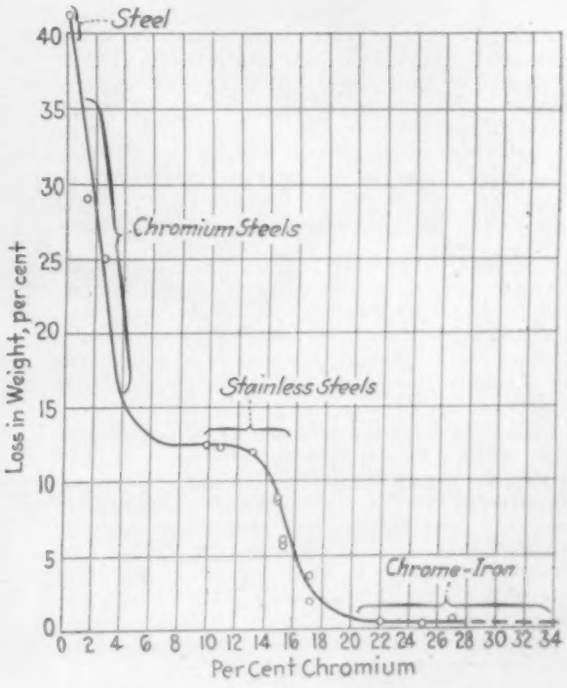
[1] F. M. Becket, "Rust Resisting Metals," Chemistry in Industry, vol. II, 1925.

[2] Andrews, Lighter and Robertson, "Some Physical Properties of Steel and Their Determination," *Proc. Roy. Soc. London.* 110 A. 391-422. 1926.

Chromium alloys, which are at present of interest to the manufacturer of chemical equipment, may be commercially divided by their chromium contents. Such division is based on inherent qualities which have led to the adaptation of the alloys to their respective fields of service. The results of an attempt at such a classification are seen in the table. It must be understood that the limits of composition and other factors are considered in the broadest sense only, nor has it been considered necessary to go into minute justifications or metallurgical reasons for the various relationships.

In connection with the table, it is of interest to note some of the properties imparted by chromium and the chief alloying elements at present incorporated in the industrial alloys. Chromium is a *sine qua non* for oxidation resistance at high temperatures. When used alone, unless it is present in amounts upward of at least 10 or 15 per cent, the alloy will not have the best chemical resistance. The oxidation resistant property of chromium is also imparted to its alloys against attack in the wet way, nitric acid being without effect if the metal contains about 12 per cent or more of chromium even in the absence of other alloying elements in appreciable amounts. If the element is used as the single alloying component, it will be found that the degree of immunity imparted is much higher if the chromium content is over about 20 per cent. This is particularly true when the material must withstand oxidation at high temperatures, as will be seen by the illustration, which shows the loss in oxidation plotted against chromium content, no other alloying element being present. It must also be pointed out that the oxidation loss shown by the high chromium alloys is about the maximum which would be obtained with indefinite exposure; this is not true for lower chromium contents since a critical point seems to exist around 20 per cent chromium.

For resistance to wet attack in other than oxidizing media, no general rules can be formulated. Chromium and chrome-nickel combinations have a remarkable versatility. Among the chemicals which are successfully withstood are acetic acid, many hydroxides, fruit and vegetable juices and mine waters. Against sulphuric acid the plain chromium iron alloys are not reliable under all conditions, although some installations have been quite successful. Unfortunately they are easily attacked by hydrochloric acid. Sulphur and sulphur gases are practically without effect on straight high chromium alloys. The presence of nickel, however, is disastrous, because of its vulnerability to sulphur.



Loss in Weight by Oxidation of Specimens of Iron with Increasing Chromium Content

Table of Commercial Classication of Chromium Alloys

Characteristic Chromium Range	Principal Properties	Some Typical Applications
0 to 5 per cent Cr. With or without one or more alloying metals, as nickel, vanadium, molybdenum, etc.	High strength, ductility and toughness and (or) hardness.	Ball bearings, tools, armor, armor piercing shells, high speed cutting tools, automobile and airplane parts. Stamp shoes, crusher parts and rolls for ore preparation, grinding equipment, saws, files, multi-ply plates for safes and vault manufacture, etc.
14 to 16 per cent Cr. added to cast iron.	Resistance to oxidation where the physical properties of cast iron are satisfactory.	Certain types of oxidation resistance requirements where the application will not bear the expense of the higher quality alloys, as in annealing boxes for malleable cast iron foundries, roasting or muffle furnaces for temperatures up to 800 deg. C. (1475 deg. Fahr.).
12 to 16 per cent Cr. Carbon content carefully controlled.	Resistance to corrosion together with excellent physical properties.	Cutlery, kitchen utensils, restaurant and hotel fittings, chemical plant apparatus to withstand nitric acid and very many other chemicals. Good against oxidation up to about 800 deg. C. (1472 deg. Fahr.). Also being used extensively in engineering applications—as in turbine blades, internal combustion engine valves, etc. Builders' hardware and decorative parts, sporting goods, marine equipment, etc.
16 up to 20 per cent or more Cr. together with considerable percentage of other alloying metals, nickel being the most frequently used. Silicon and manganese are present in some analyses up to several per cent.	High electrical resistivity and non-oxidizing. High tensile strength at elevated temperatures is a feature. Some have hot and cold working properties.	Electrical Heating Elements. All kinds of heat-treating equipment such as case carbonizing boxes, annealing boxes, pyrometer tubes, furnace parts, etc.
20 per cent Cr. and upward. No appreciable alloying elements other than carbon.	Resistance to oxidation and to many forms of chemical attack, especially nitrates and sulphur. Softness and workability in low carbon ranges; hardness.	All types of apparatus which are subjected to oxidation up to about 1100 deg. C., such as stills, muffles, retorts. Crushing and grinding equipment. Nitric acid plant equipment. Mine pumps.

Chromium imparts high tensile strength to its alloys but, in the higher ranges of chromium content, somewhat decreases their ductility. Alloys containing 20 per cent chromium and upward are readily worked by the usual steel mill equipment to form plates, sheet, rods, wire, seamless tubing, etc. A peculiarly advantageous property of chromium is that of imparting high tensile strength at high temperatures; this opens up a field of applications which is becoming quite extensive. The presence of nickel greatly enhances the strength and stiffness and diminishes the elongation at high temperatures, thus increasing the resistance to flow under sustained loads at high temperatures.

Welding Chromium Alloys

A matter important to the chemical equipment manufacturer is the question of weldability of the chromium alloys. They do not hammer-weld but may be readily joined by fusion welding, either gas or electric. Because of the increasing commercial interest in the subject, some general observations will be in order.

The welding of chromium-iron alloys is attended with more difficulty than is the case with ordinary steels, due to the formation of infusible chromium containing oxides. The oxide formed is difficult to float and, unless eliminated, may give rise to such defects as blowholes, laps, and similar defects. The chromium-iron alloys may be satisfactorily arc welded, using for an electrode a wire of the same material coated with a flux which is capable of combining with or dissolving the oxides formed. Such electrodes, when suitably coated and used with the proper polarity, will give good dense welds. Some flux coatings will yield good results with either polarity, while others will work with reversed polarity only (electrode positive). Welds made by this process will possess good strength, are easily machinable, but will lack in ductility. For ordinary batch mixing or storage tanks, this lack of ductility in the weld would be of no consequence. However, in vessels destined for high pressure and temperature, lack of brittleness is important, and no such work should be undertaken without first consulting with someone experienced in the making and properties of welds in high chromium-iron alloys.

In order to oxy-acetylene weld the high chromium-iron alloys, it was formerly found that satisfactory welds could be obtained by using an excess of acetylene in the welding flame. While this procedure does prevent oxidation and makes the welding easy, at the same time it charges the weld metal with considerable carbon, making it quite brittle. This practice or method of welding, while satisfactory in some instances, is not generally recommended.

Neutral flame welding may be used by coating the line of the weld and the welding rod with special fluxes capable of protecting the hot metal and dissolving any oxides formed. Another solution to neutral flame welding is to use welding rods containing appreciable quantities of manganese and silicon whose oxidation products yield a fusible protecting slag. It is recommended that a small amount of flux be used on the line of the weld to take care of oxidation of the base metal. Research work is proceeding in this field and it is believed that the peculiar problems met in this type of welding will soon be overcome to permit safe welds for high pressure and resistance to shock.

Electrolytic Zinc in Galvanizing

Its Durability in Comparison with That of Prime Western—Experiments Under Way to Reduce Dross and Increase Tenacity of Coating

PROBLEMS which are perplexing to producers and consumers of galvanized sheets were brought into fresh prominence by the editorial in THE IRON AGE of June 17 on "Some Trends in Galvanizing." Leading mill executives who have commented on the article, while not in accord with all the opinions expressed, freely acknowledge that galvanizing practice can be improved. In their belief, however, the extent to which sheets are improperly or too lightly galvanized has been exaggerated in the minds of many because of the publicity the subject has received, much of it at the instance of the sheet manufacturers themselves in their effort to correct the evil.

It is perhaps not generally appreciated, one manufacturer states, in discussing the subject with a representative of THE IRON AGE, that complaints regarding the thinness of zinc coatings on galvanized products have been confined mainly to galvanized sheets for roofing purposes. The cause for complaints of this character is not to be found in mill methods but is traceable to the practice, common among the final distributers, of buying roofing sheets by the pound and selling them by the square—a practice which has led to the sale of thinner and thinner sheets with the correspondingly lighter coatings which the lighter gages tend to carry. Whereas formerly No. 24 and No. 26 galvanized sheets were standard for roofing purposes, the time came when No. 29 and even lighter sheets were employed. The thinner gages generally do not carry a heavy enough coating of zinc to resist the severe weather conditions to which they are subjected.

The elimination of excessively light-gage sheets for roofing was a part of the simplification program of the Department of Commerce and was one of the first things the Sheet Steel Trade Extension Committee set out to accomplish. Much has been done in that direction, and in time, it is asserted, there will be an end to the use as roofing of galvanized sheets that are too light in weight of base metal and of zinc coating.

Thin Coatings Required on Sheets for Rapid Working

The charge that galvanized sheets are commonly too thinly coated cannot be substantiated, according to manufacturers. Heavier coatings can be obtained, and a regular table of extras for such coatings has been in force for a number of years. For flat work or when sheets are corrugated only, a coating of 2½ oz. per sq. ft. is practicable, except on the extremely light gages. For corrugating and subsequent curving work, as in the making of culverts, the coating specified is usually 2 oz. per sq. ft. of steel. It is contended that it well might be less, for the zinc may crack and peel off when the steel is fabricated into some of the smaller diameter culverts. Galvanized sheets which are formed in rapidly operating automatic presses must have as thin a coating as possible, to prevent the cracking and breaking of the coating. Zinc will flow under very slow pressure, but rapid working will produce flaking.

Galvanizing after fabrication is to be desired but is usually too expensive. In this process the formed products are dipped in a zinc bath, with the result that while the total weight of zinc used in the coating is heavy, it is lacking in uniformity, having light edges and heavy spots in the corners.

Greater Durability of Electrolytic Zinc in Question

That galvanized coatings corrode largely because of metallic impurities in the zinc which set up foci of chemical reactions has been discussed not a little. Prime Western spelter, which is generally used by sheet galvanizers, contains small percentages of impurities. However, there does not yet appear to be

sufficient evidence, sheet producers state, to warrant the acceptance of the theory referred to. Metallurgists of the mills and producers of zinc are giving the subject careful study, but have not yet demonstrated that a coating of electrolytic zinc gives better protection against corrosion than one of prime Western zinc.

Try Zinc Chloride Bath as Dross Preventive

Another problem which has perplexed galvanizers is the large loss in dross, which averages about 15 per cent. A theory recently advanced is that iron oxide which is formed in the bath of hydrochloric acid solution prior to galvanizing results in increased dross. It is thought that the formation of iron oxide may be prevented by substituting a zinc chloride bath for the hydrochloric acid solution before running the sheets through the galvanizing pot. Experiments have been undertaken to ascertain whether this change in practice will produce the desired effect.

A disadvantage in the use of electrolytic zinc coating is its modifying effect on the crystalline appearance of the coating. Spangles are an important factor in influencing sales because they lend beauty to the sheet. They may or may not reflect the quality of the steel. An important qualification of galvanized sheets is that the zinc coating be adherent and capable of standing up under severe forming operations. Yet this subject is one on which little definite information is available, according to mill men. What are the variable factors that determine the tenacity with which a zinc coating will adhere to a steel sheet? How is one to explain, for instance, why a 1¾-oz. coating will sometimes stick and a ¾-oz. coating will fail, both being used for the same purpose? It may be that the purity of the zinc, or at least its freedom from certain impurities, will in large part explain this phenomenon, and considerable research and practical work are being put on this phase of the question.

Annealing and Carburizing to Make Coating Tenacious

Annealing has been tried as a means of increasing the tenacity of the zinc coating. On the ordinary galvanized sheet the zinc seems to form two layers of alloy with the steel, each having a different composition. On top of this is a layer of pure zinc. By annealing, the zinc alloy layer is brought closer to the surface. Such a zinc alloy coating is believed to hold better than an unannealed zinc coating, but whether it weathers so well is still a question to be determined by proper tests.

Wire galvanizers, who commonly use electrolytic zinc instead of prime Western, have found that the carbon content of the steel is an important factor in determining the adhering qualities of the coating. One wire manufacturer carburizes the surface of the wire to increase the tenacity of the coating.

Pending further research, it is urged that the difficulties of consumers will be largely eliminated if they carefully specify grades of sheets suitable for their particular purposes. The Sectional Committee on Zinc Coatings of the American Engineering Standards Committee, is now undertaking to formulate standard specifications with particular relation to the most suitable weights of coatings for various fields where galvanized sheets are employed.

Suiting the Sheet to the Work Is Greatest Need

Speaking on this subject at a recent meeting of the Metal Branch of the National Hardware Association of the United States, Walter C. Carroll, vice-president Inland Steel Co., Chicago, said:

"It is true that the field of usefulness for Master Brand galvanized sheets (a master brand sheet, as defined by the Steel Trade Extension Committee, must be No. 28 gage or heavier and must have a stipulated minimum coating of zinc) is limited. This is due to the fact that the spelter coating is too heavy to withstand severe or rapid machine operations. It is impossible to cover the entire range of purposes for which galvanized sheets can be used with one quality or one weight of coating for any particular gage. There are really four important galvanized grades which should be made.

"We may classify these four grades as follows:

"1. In the first class are those sheets which are to be used for flat work or are to be corrugated only.

"2. In the second class are those sheets which are to be corrugated and subsequently formed in curving rolls. In this class would be sheets for culverts.

"3. In the third class are sheets for general forming work, such as cornices, ventilating systems, etc.

"4. In the fourth class are sheets which must be drawn in dies or formed by high-speed machine operations, such as garbage can covers, corner bead, machine-made conductor pipe, window frames, sash, etc.

"The master brand coating will satisfactorily answer the less severe requirements under class 3. In many instances the master brand coatings will be more satisfactory for work in class 2 than are the heavier coatings which are frequently specified for work of this character. Furthermore, with the exception of unusual atmospheric conditions, master brand sheets should give an excellent account of themselves under class 1. This leaves class 4, where sheets must carry an extremely light and tight coating, and the more severe requirements of class 3, for which we will not recommend master brand sheets to be sold."

Testing Society's Fall Group Meeting Abandoned—The 1927 Annual Meeting

The board of directors of the American Society for Testing Materials has decided not to hold the usual fall group meeting of committees which has been a feature of the last three years. Tentative arrangements had been made to hold this year's meeting in Detroit in October, as announced in THE IRON AGE, July 1, but a canvass of the standing committees has indicated that only nine of these would probably meet conveniently at that time and place and, of these, two are uncertain. These include only one or two of the larger committees so that the attendance would probably be not much over 100. This would not justify the holding of a group meeting.

Two committees find it advantageous to meet at the same time as the American Foundrymen's Association and a third will meet at the same time as the American Chemical Society. Several other committees find it desirable to meet at certain places of particular interest to their members which have also an important relation to the activities of the committees. Plans for a group meeting in the spring, however, are being made and definite announcement will be forthcoming later.

A recent canvass of the members of the society as to the advisability of holding the 1927 annual meeting at some other place than Atlantic City has resulted in 1020 replies out of a membership of over 4000. A tabulation printed in the society's *Bulletin* for July shows Atlantic City to lead as first choice with 398 votes, French Lick Springs with 193 and the Lake Placid Club with 181. As second choice the Lake Placid Club was first, with 181, Atlantic City second with 160 and French Lick Springs third with 133 out of 894 votes. The selection of the place will be made by the executive committee by the time of its next quarterly meeting in October and will be announced soon thereafter.

Die-head chasers for self-opening and adjustable die heads is the subject of simplified practice recommendation No. 51, issued recently by the Bureau of Standards. The history of this simplification project, survey of conditions in the industry, and a list of the companies accepting the recommendations are included in the pamphlet, copies of which may be had from the Government Printing Office, Washington. The price is 5 cents.

The semi-annual meeting of the American Gear Manufacturers' Association will be held Oct. 14, 15 and 16 at Briarcliff Lodge, Briarcliff Manor, N. Y. The program of the meeting will be announced later.

NEW FURNACE LINING

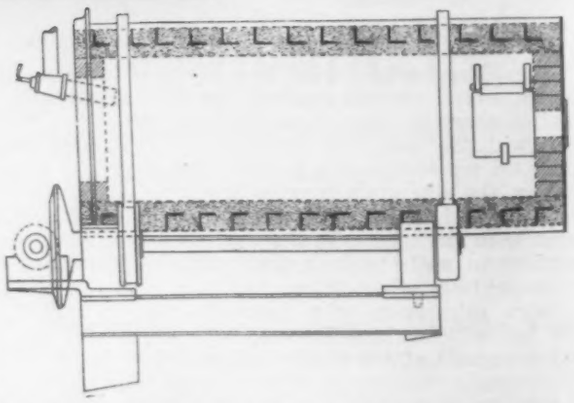
Monolithic Structure Replaces Brickwork—Method of Using

BY ROBERT WALKER*

MONOLITHIC furnace lining is being used in place of the special brick formerly employed for an oil-fired annealing furnace by a steel company for heat-treating small bolts. The furnace is mounted on trunnions at an angle of about 8 deg. from the horizontal and is rotated about 15 r.p.m. It is operated continuously at about 2000 deg. Fahr. The cycle of treatment is 5 to 7 min.

Charging Continuous Rotary Heat-Treating Furnace. The lining is shown after three months of constant service

Section of Monolithic Lining (Below) Shows Welding Wires for Anchoring the Lining to the Shell



The monolithic lining was made as follows: Quarter-inch welding wires 5 in. long, bent at right angles in the middle, were spot-welded to the inside of the furnace shell, about 5 to 6 in. apart, over the entire surface. These serve as anchors for the one-piece lining. The material for the lining was crushed old fire brick (¼-in. mesh and fines) mixed with hytempite in the proportions of 175 lb. of crushed brick to 100 lb. of hytempite diluted with water. Care was taken that the hytempite was first diluted in a mortar box and the crushed brick added gradually and thoroughly mixed to a stiff consistency.

This mixture was rammed in the entire length of the bottom of the furnace to a depth of 4 in. By giving the furnace a quarter turn at a time, ramming was continued along a fresh portion of the shell until more than half the lining was completed. Then 2 x 6-in. undressed boards supported by cross members were laid the length of the furnace against the lining, to support it while the remainder was rammed into place, and a form was also placed around the discharge door opening.

When the rammed-in lining was completed, another set of cross members and supports was placed. All bracing was left in place for 18 hr. and then one course of 4-in. circle brick was laid up, to reduce the opening at the front, and circle brick were used also in a similar way to close the rear of the furnace. A drying fire was lighted, starting with a slow heat. Two days later the furnace was put into service.

A little patching once or twice a month keeps the interior smooth and has eliminated former trouble and loss of products treated.

*Sales engineer, Quigley Co. of Canada, Ltd.

City Coke Ovens Recommended for Philadelphia

A suggestion that the city of Philadelphia build municipally owned by-product coke ovens has been made by the Bureau of Municipal Research, Philadelphia, in a report on the new city gas lease which will be entered into, to be effective from Jan. 1, 1928. The question has come up in connection with the proposal of private interests, including the Philadelphia Foundrymen's Association, that a blast furnace and coke ovens be built in Philadelphia by private capital.

The Philadelphia bureau points to the experience of the city of Baltimore in purchasing gas from a private plan.. At times the condition of the steel market has made it uneconomical for the Bethlehem Steel Co., which sells coke oven gas to Baltimore, to operate all of its ovens; the quantity of gas produced at its plant has therefore at times been reduced, and the Consolidated Gas, Electric Light & Power Co., the company which supplies gas in Baltimore, has at such times been obliged to make the additional gas in its own plant.

"If it is good business for a private company to erect by-product coke ovens," says the Philadelphia report, "the question arises whether the city could not profitably build such ovens as part of its plant."

The proposal of private interests to build a blast furnace and a coke plant in Philadelphia is contingent on permission being obtained from the city government enabling the United Gas Improvement Co. to purchase the coke oven gas. As noted recently in THE IRON AGE, the city has employed William Hutton Blauvelt, 120 Broadway, New York, as consultant in the gas situation, and Mr. Blauvelt is making an investigation of the blast furnace project in conjunction with the other aspects of the proposed new gas contract.

Commercial Arc Welding Applications

Gas-Holders, Piping in Large Sizes, Purifiers for Gas, Details of Construction, Doors and Blast Gates Handled

BY W. L. WARNER*

STUDY of the various applications of electric arc welding, especially by one who may be ignorant of the technique of the process, reveals many interesting facts. In some cases arc welding is used as a repair tool, to reduce maintenance costs and prevent lost time caused by delays in replacement of broken parts. In others the process is used as a part of the production scheme, to decrease the cost or to simplify the manufacturing operation. Wherever the use of arc welding is seriously considered, its application is generally extensive.

Electric welding has passed the experimental stage with the Western Gas Construction Co., Ft. Wayne, Ind., and is now a standard method of construction. It results in a lighter product and makes the construction work easier. Fig. 1 shows an all-welded gas holder of 15,000 cu. ft. capacity erected by this company at Lexington, Mo. As far as is known, this is the first all-arc-welded gas holder ever built in this country.

Two welders and three mechanics worked about six weeks to complete the holder, which is constructed of ¼-in. and 3/16-in. plate. The joints are ⅝-in. laps welded inside and out, using 5/32-in. electrode and 120 amperes welding current. The erection of the first course of side plates and the bottom is shown in Fig. 2. An arc-welded job of this sort can be done at about 15 per cent less expense than a riveted job, and no calking of seams is ever required. When assembling the side plates, small clips were used for tack welding, after which the welding was completed. The concrete base is standard construction and the inlet and outlet pipes are welded to the shell of the tank.

A welded carburetted water gas generator has doors and shell arc welded, thus eliminating castings. Fig. 3 is a detail view of the door construction. The use of arc welding for this work saves about 15 per cent in direct labor costs in the shop. The blast and

*Industrial Engineering Department, General Electric Co., Schenectady, N. Y.

At Left Is Shown Erection of First Course of Side Plates for Gas Holder Shown Below It. Below is an automatic arc welder for side seams of pipe

(At Left) Arc-Welded Gas Pipe Connections and Fittings

(Below) Arc-Welded Steel Gas Purifier

(Below) Arc-Welded Door Frame for Gas Generator

gas piping for these gas generators are welded also. It is much easier to construct welded blast pipe than to rivet it. The pipe is made up in standard lengths and the joints are butt-welded. Fittings are laid out on the pipe, the necessary cuts made, and the fittings welded on. Welding this pipe eliminates trouble from leaky joints and the necessity for calking.

Welding also plays an important part in the construction of gas purifiers. Fig. 4 shows one type, all arc welded, built by the Western Gas Construction Co. complete at its plant and shipped as a unit to the place of erection. A saving of approximately 25 per cent was effected by using arc welding. The washer cooler for this job was built in two sections, which were later joined by a lap weld in the field. The joints and piping are arc welded. The shell is ¼-in. material and the two sections were put together in a horizontal position and then raised complete.

Until a few years ago tar extractors were built of cast iron. This construction was changed to riveted steel and now arc-welded construction is used for the shell. An arc-welded tar extractor so made has a shell of ¼-in. material and the joints are butt welds. There is no welding done on the inside of the extractor. About 125 amperes with a 5/32-in. electrode was used. A saving in cost of about 15 per cent was realized.

All straight pipe made by the Western Gas Construction Co., where butt welds are used, is welded with an automatic arc welding machine. The automatic arc welding apparatus is shown in Fig. 5. For ¼-in. plate, 5/32-in. diameter electrode with 200 amperes, at a speed of about 4½-in. per min., is used. On 5/16-in. plate, 3/16-in. electrode with about 230 amperes is used.

Various shapes of pipe joints and fittings are constructed by arc welding as shown by Fig. 6. These fittings were made of straight pipe welded on the automatic arc-welding machine. The fittings were cut out of the pipe by hand and welded together, inside and outside. The service pressure of this piping is about 2 lb. per sq. in. and it is all tested to 25 lb. per sq. in. The pipe ranges in size from 2 ft. to about 5 ft. in diameter. A welded blast gate, also built by the company, weighs about one-third as much as a cast iron gate of the same capacity and costs less.

Bright Annealing by Gas Furnaces

Making Percolator Parts in the "Silver City"—Air-Gas Ratio Regulated to Prevent Scale Formation

BY J. B. NEALEY

MERIDEN, Conn., the "silver city," is the home of Manning, Bowman & Co. products, made by the craftsmen who have been raised in the atmosphere of the silverware industry. Many of the employees have been with this company 30 years or more, and one employee has seen 56 years of continuous service. This company manufactures table appointments, including electric percolators, toasters, curling irons, soldering irons, heating pads, flat irons, waffle irons, as well as vacuum bottles, casseroles, crumb trays and a wide variety of other articles.

Electric percolators made here are a fair example of the amount of detail and care that goes into all of its products. To make one electric percolator, 78 separate pieces are required, and it passes through 288 different operations between the original stock and the packing box. A feature of this percolator is the automatic safety device which protects it if the user goes away and leaves the current on. In such a case this device automatically shuts off the electricity before the heat of the percolator rises to the melting point of solder.

These percolators are of nickel-silver, silver plated, and copper-nickel plated. The stock comes to the factories in special sized sheets, cut to width and specially tempered. The first operation is in the press room, where the parts are cut out in powerful punch presses, and then drawn and redrawn in several operations. Between drawings the metal is annealed in a gas-fired furnace and quenched in water. This is done several times before the parts are ready for the assembly and buffing departments.

Annealing is done in furnaces designed by the Surface Combustion Co., New York, which are of light steel construction, suitably stayed and insulated. These furnaces have a system of combustion adapted for both

One Corner of the Press Room, Showing Work in Process. For deep drawing such as this, several annealings are necessary between operations

Quenching of Small Annealed Products in Basket Coming Out of Furnace at Manning, Bowman & Co. Plant

high and low pressure. In the high-pressure system city gas is raised from line pressure to about 10 lb., and air is drawn in through a patented inspirator in the proportion for complete combustion. In the low-pressure system, as used in this plant, air is boosted to 1 or 2 lb. pressure, and gas is entrained, through the same inspirators, in correct proportion.

This air-gas ratio is always maintained regardless of the manipulation of the single valve that regulates the flow of the mixture to the burners, to raise or lower the heat. The flames are played on or through beds of pocketed refractory material, which become incandescent. This is found to increase the rate of combustion and promote heat radiation, the fastest known way of transmitting heat. These three factors, air-gas ratio, accelerated combustion and developed radiation, combine to make an efficient burner.

One feature of this furnace is the control of its atmosphere, so essential in the heat treatment of metals. This is accomplished by the regulation of the air-gas ratio. Before this furnace was installed, it was necessary to pickle all work after annealing, to rid it of scale; but with the new furnaces no scale is formed and a large saving in cost of acids and labor is made through the elimination of this operation. This is what is known as bright annealing.

Operating cost of the furnace per pound of metal is less than that of the older type of furnaces. The work is pushed in at one end of the furnace by a hydraulic jack and is allowed to remain in temperatures from 800 to 1300 deg. Fahr. for varying lengths of time, according to the size and kind of material, when it is forced out at the other end by the same jack and automatically dropped into a tank of water, where it is quenched. All kinds of non-ferrous metals are thus treated, nickel-silver alloy, copper, brass, aluminum, etc.

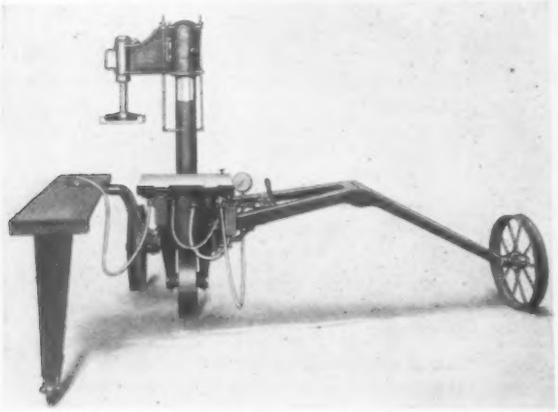
Percolators that, under old-time methods, would have cost $70 to $80, are now being turned out for something like one-twentieth of that price. The different parts pass from machine to machine, where they are cut, punched, trimmed and formed into shape. Buffing is done semi-automatically—the men simply changing the pieces as they are finished. Screws, nuts, bolts and other pieces of small size are turned out in automatic machines.

Annealing Furnace (Entrance End) at Manning, Bowman & Co. Plant. Control of the fuel and air prevents scaling

Jolt Squeezer Molding Machine Designed to Straddle Sand Heap

A jolt squeezer, arranged for straddling the sand heap, as shown in the illustration herewith, has been added recently to the line of the Arcade Mfg. Co., Freeport, Ill.

In this design the outboard wheels are spread wide apart and the main wheel, which is mounted in roller bearings, is located directly below the cylinder, thus forming a solid foundation for the jolt impact and giving rigidity to the outrigger. The squeeze cylinder, which is 10 in. in diameter, has a capacity of 450 lb. The jolt cylinder is 4 in. in diameter. The table is



In Turning the Machine the Rear Wheel Is Lifted and the Main Wheel Used as Pivot

16 x 18 in. and the largest flask recommended by the maker for use on this machine would be 18 x 24 in.

The outrigger is made up of two steel castings, and the support for the swinging head is of 5-in. outside diameter pipe with ¾-in. walls. The top nut on the squeezing-plate screw is held in such a manner that vertical adjustment can be made without the use of a wrench. On the back of this machine is a cast opening large enough to take a 2-in. pipe, with which it is a simple matter to turn the machine around by lifting up the back wheel and pivoting the machine on the main wheel. The distance from the main wheel to the outrigger is 5 ft., but this can be increased to 6 ft. for extra wide sand piles.

Rail for Overhead Monorail Systems

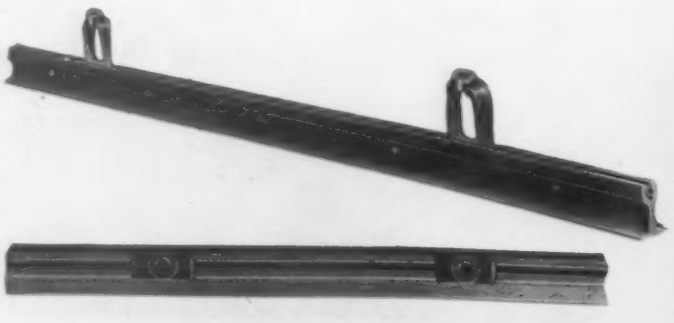
The American Monorail Co., West Sixty-seventh Street and Pear Avenue, Cleveland, is offering what is claimed to be a new and distinctive rail design for overhead hand-power monorail systems. Features include a two-part rail, clamped together by means of bolts seated in slotted holes, suspending hangers assembled with the rail, and elimination of splice clamps. Unusual carrying capacity, permitting wide spacing of hangers and bridging of wide spans is claimed; and the assembly of the hangers as part of the monorail sections is stressed as materially reducing the cost of installation.

The construction of the rail may be noted from the illustrations. It consists of two twin sections rolled from railroad rail steel, the sections being bolted together, back to back, to form a solid rail unit. The disposition of the metal in the two sections is said to be such that the assembled rail is capable of bridging unusually wide spans and sustaining its load without deflection. The high vertical web of the rail is intended to provide maximum carrying strength, while the narrow overall width dimension of 2 in. facilitates bending of the rail in the field to meet any layout requirement. Holes for the clamping bolts are slotted to relieve the bolts of shear stress as the sections are being bent. Standard bent sections are furnished for all regular curves and for irregular bends where conditions are known.

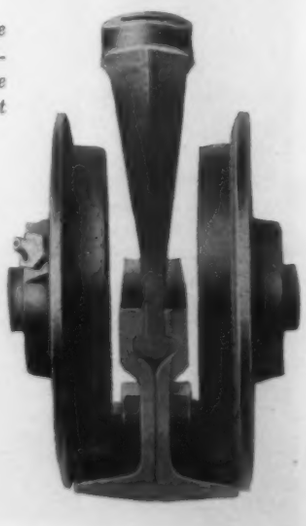
The supporting hangers are steel forgings and are adapted to plain strap or adjustable bolt suspension. They are assembled in the rail head, as shown, and shipped as part of the rail sections. The standard spacing of the hangers can be quickly shifted to meet suspension requirements. Clamping the hangers inside the rail head instead of bolting them to the outside is stressed as permitting ample rail tread for the trolley wheels, and eliminating interference between the wheels and rail hangers. The hangers have a bearing surface of 3¼ in. inside the rail head, which eliminates possibility of rail "creeping."

An important feature of American monorail is the overlapping end connections. No splice clamps are required, and when the overlapping ends are bolted together they form a continuous monorail runway with no completely broken joints. Connecting joints being staggered on opposite sides of the rail, trolley wheels never cross joints on both sides of the runway at the same time. When the runway is erected, and overlapping ends are bolted in place, the splicing points are said to be as solid and rigid as any part of the system. The forged hanger supports at the splicing points prevents deflection of rails.

Section of the Monorail With Hanger Seated on the Rail Is Shown at Upper Right. The method of splicing may be noted from lower view



A New Feature Is the Clamping of the Monorail Hanger Inside the Rail Head, as Shown at Right



Late Models of Acme Screw Machines to Be Built at Windsor, Vt.

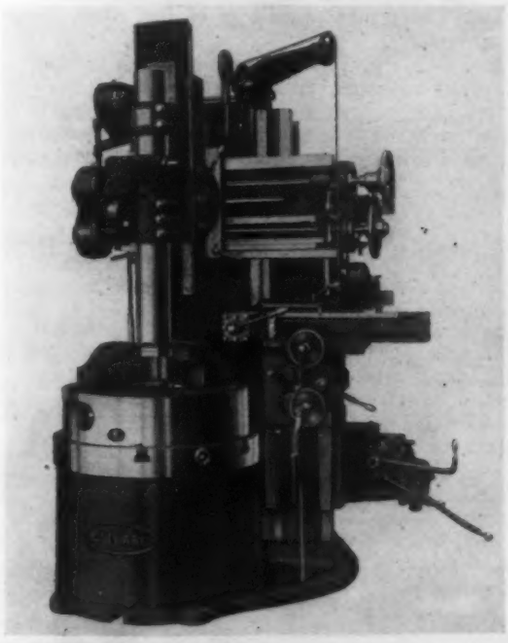
The latest types of Acme automatic screw machines, models B and C, of the National Acme Co., Cleveland, will be built at the company's Windsor, Vt., plant, this consolidation of manufacture being expected to effect economies. The company's model A Acme, the older type, known in the trade as the Nos. 52-56, will for the present continue to be built at Cleveland.

The reorganization and changes in personnel of the company were noted in THE IRON AGE of Aug. 5. The general sales offices remain at Cleveland, where a stock of tools and repair parts for all types of the company's machines will be carried. Screw machine products, standard screws and nuts, and automatic threading tools will continue to be manufactured at the plant of the company at East 131st Street and Coit Road, Cleveland.

Improves Driving Box Borer and Facer

Increased adaptability to various lengths of boxes and strengthening of the tool support to permit heavier cuts and close accuracy are features of an improved driving box borer and facer which is being placed on the market by the Bullard Machine Tool Co., Bridgeport.

In place of the "banjo type" main head and boring bar, the new machine is provided with a cast steel



A Cast-Steel Main Slide of Extra Length, Designed to Support a Boring Bar Long Enough to Accommodate Driving Boxes Up to 23 In. Is a Feature

main slide of extra length, designed to clamp and support a heavy steel boring bar of sufficient length to accommodate boxes up to 23 in.

The new design provides a heavier support for the bar and cutting tools and an adjustment in bar extension from the main slide to suit the various lengths of boxes. For the shorter boxes, less extension is required, and, therefore, the cutting tools are supported closer to the point of cutting. This adjustment is readily made by hand crank through worm and gear to a rack in the bar. Clamping bolts to the main slide are then firmly secured and vertical tool feed is obtained through the main slide. The various diameters of boxes are obtained by bringing the main head, bar and cutting tools close to the work by cross traverse and reading dimensions directly from scale and micrometer dials. This arrangement is stressed as avoiding excessive overhang or extension of tools from the boring bar.

A heavy two-jaw self-centering chuck is provided for holding the work securely on the opposed faces. The machine is also provided with a graduated micrometer cross adjustment for boring reliefs. The chuck is fitted for locating the box accurately on the vertical axis and for holding the cellar in place for boring.

Other standard features include a constant-speed drive pulley with multiple disk clutch and brake for starting and stopping the machine. All speed and feed changes are obtained by sliding gears within the machine itself. Centralized control, power rapid traverse for both vertical and cross movement of the main head and constant flow lubrication to all moving parts are also features. The direct-reading scales and micrometer dials on the feed rods are of material assistance in gaging and duplicating sizes of work. Recently revised material specifications provide added strength in the driving train of shafts and gears and all other operating and supporting units subject to the strain of heavy cutting.

Improved Portable Belt Conveyor

An improved type of portable belt conveyor for handling sand, gravel, brick, boxes, coal, coke and similar materials has been put on the market by the Jeffrey Mfg. Co., Columbus, Ohio. The machine was designed for road construction and yard service and industrial plants where it is desired to handle materials from hopper bottom railroad cars to storage or trucks, and for reclaiming from storage piles.

Among the features are steel side boards which are bent to extend under the side of the belt, forming with the belt a moving trough which provides larger capacity and prevents lumps from rolling off. An improved type of carrying idler is used to support the loaded portion of the belt and the machine is provided with an extended and flared loading leg at the bottom, edged with belting material to form a seal with the moving belt. The flared hopper also centers the load on the conveyor. Another feature is the gate at the foot of the conveyor which is intended to prevent material from falling into the inclosed boot housing.

The conveyor is available in lengths of 18, 24 and 30 ft., and is furnished with electric motor or gasoline engine. The elevator may be adjusted easily to any convenient height and holes are provided with alining screws to bring belt in center. The belt furnished is 16 in. wide, rubber covered and troughed. The idler is of cast iron and in one piece and the return idlers are said to form an efficient belt-cleaning device. The loading leg is arranged so that material is bunched up in the center of the belt, and avoids side spill. Steel flights are attached to the center of the belt to increase

The Machine Is Furnished With Electric Motor or Gas Engine and in 18, 24 or 30 Ft. Lengths

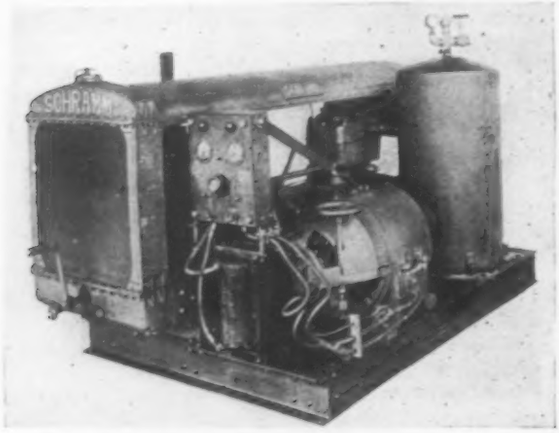
carrying capacity of the machine and keep small round particles from rolling down the belt. These flights are arranged so that they cannot catch on material and tear the belt.

Builder of Rolling Mill Equipment Buys Hyde Park Plant

The Hyde Park Foundry & Machine Co., Hyde Park, Pa., has acquired from the American Sheet & Tin Plate Co. the old Hyde Park works, and now is engaged in making changes preparatory to moving from its present location. All of the buildings of the old sheet mill except the main mill building have been razed. This building is to be partially rebuilt and strengthened by heavy structural steel to support cranes of large capacity. Fabrication of the steel is being done in the present shop of the company. The site covers 15 acres, affording ample space for such future plant extensions as may be necessary.

Combination Compressor and Arc Welder for Field Use

A portable combination unit made up of a Schramm air compressor and a General Electric arc welding outfit, driven by a Buda gasoline engine mounted on a single base, and intended for a variety of field operations, is here illustrated. This equipment, which is being marketed by Schramm, Inc., West Chester, Pa.,



The Combination Unit May Be Carried on a Motor Truck or Mounted on Steel or Rubber-Tired Wheels

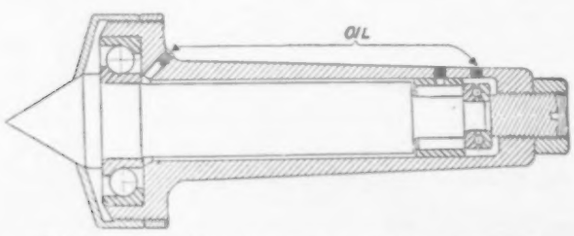
may be carried on a two-ton truck or made portable by adding steel or rubber tired wheels.

In field work the air compressor may be used to operate drills, grinders and chipping hammers for cutting, peening, calking and cleaning off scale. The compressor can also be used in preparing work for welding. With the arc welder light and heavy gage steel can be welded as well as cast iron. After the welding is completed, the compressor clutch is thrown and the weld can be ground or chipped as desired.

The Buda engine is a 24-hp., 800-r.p.m. unit, which may be started and operated independently of either the compressor or welding generator. The compressor is a two-cylinder, water-cooled machine with a capacity of 120 cu. ft. per min. and is equipped with an automatic unloading device. The air receiver is 16 in. in diameter by 42 in. high. The welding equipment consists of a belt-driven General Electric WD-12 arc welder, with an idler pulley for belt tightening. The base is of structural steel and is 8 ft. 4 in. long and 5 ft. 11 in. wide. The height of the outfit is 3 ft. 10 in. The weight is 4000 lb.

Ball-Bearing Lathe Centers With Load Capacities Up to 7000 Lb.

Ball-bearing lathe centers of improved design and in six sizes, with load-carrying capacities ranging from 200 lb. to 7000 lb. at 600 r.p.m., have been brought out by Nielsen, Inc., Lawton, Mich.



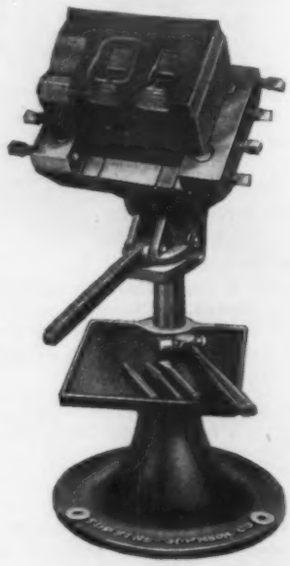
The Bearings Absorb Both the Radial and Thrust Loads. Arrangement for taking up wear is a feature

These centers, the construction of which may be noted from the accompanying line drawing, are designed to minimize overhang. A combined radial and one-direction thrust bearing is provided at the front, and a roller bearing operating on the hardened and ground spindle is at the rear. The thrust bearing at the end of the spindle gives added strength to the spindle and facilitates its running. Provision for convenient adjustment of bearings is a feature stressed as lengthening the life of the centers. The length of the spindle and its bearing arrangement keep the center point in alinement and eliminate the possibility of a wobbly point even after long use. The bearings run in oil and are fully protected from dust and dirt. They are oiled once a month through holes provided as shown. The center spindle is of tool steel, hardened and ground.

A ball-bearing pipe center, for use in turning tubes and cored castings, is also available, as well as a counter-sunk center for use in turning parts with pointed ends. The company also manufactures a ball-bearing wood-turning center for use in pattern shops.

Adjustable Stand for Holding Die Blocks and Other Work

Savings in floor space and increased production are advantages stressed in connection with the universal work stand here shown, which although designed primarily for holding die blocks is adaptable to a variety of other uses. In automobile shops the device may be used to hold fenders, doors, radiators and other parts that are to be finished.



The stand is being marketed by the Tomkins-Johnson Co., Jackson, Mich. When used for holding die blocks, the die block is placed upon the table of the stand and held secure by means of a vise. The stand is adjustable as to height and direction, which permits the die sinker to turn the die block in any position while working. The adjustment for direction is through a ball and socket joint. Special attachments and fittings may be used in place of the regular vise provided. The shelf for holding tools is 12 in. wide and is located so that all the necessary tools may be within easy reach.

Manufacture of Farm Equipment

Production of farm equipment in 1925 is reported by the Department of Commerce to have amounted to $383,736,736, an increase of 18.7 per cent over the $323,367,127 of 1924 and of 5.2 per cent over the $364,854,106 of 1923. Of the total, $332,845,204 represents sales by the manufacturers in the United States, while $64,934,212 in value represents sales for export, the highest ever recorded. The figures do not cover sales by dealers to consumers. Sales figures do not agree with production figures, due to overlapping of years.

Principal among the items are farm tractors and traction engines, valued in 1925 at $120,558,518, or nearly one-third of the total. This item showed also the largest export total, at $27,537,859, or more than 40 per cent of all exports. Harvesting machinery at $28,418,503, machines for preparing crops for market or use at $27,696,672, and plows at $23,644,833 were the items next in importance. Harvesting machinery was the only one of these important items which showed a reduction from 1924.

Data for 1925 were reported by 981 manufacturers. This compares with 949 in 1924 and 1135 in 1923.

European Steel Condition Better

England Running on Continental Fuel—Big French Rail Order and Russian Tube Contract—Cartels in the Making

(*By Cablegram*)

LONDON, ENGLAND, Aug. 9.

PIG iron is stagnant, stocks of Cleveland iron are scarce and consumers are hesitating about buying. Only two North-East Coast foundry iron furnaces are now blowing. Foreign ore is idle; Bilbao Rubio only nominal.

Finished steel generally is quiet. Production is increasing, with foreign fuel, but makers are well sold and are asking 10s. ($2.43) over the minimum price, for two to three-month shipment, and up to 25s. ($6.07) premium for shipment of material now being rolled.

Tin plate is quiet, with prices generally steady. Tin plate now being rolled with foreign fuel and steel is offered at 22s. 6d. ($5.67); for shipment four to six weeks after the strike is over, quotations are 20s. to 20s. 3d. ($4.86 to $4.92). Stock plates are held at 24s. 6d. to 25s. ($5.95 to $6.07); all basis, IC, f.o.b. works port. Galvanized sheets are firm and quiet. Black sheets are idle.

On the Continent of Europe

Continental markets have been strengthened on the appreciation of the franc and moderate demand from British consumers in anticipation of the formation of an international steel cartel. Sheet bars are being sold at £4 17s. 6d. ($23.70) f.o.b. and supplies are scarce. The French rail syndicate is reported to have booked 100,000 tons of rails for France at 668 fr. ($19.70 at 2.95c.) per metric ton, delivered. Otto Wolff has secured a $5,000,000 tube order from the Russian oil trade, on credit extending to four and one-half years.

GERMAN MARKET BETTER

Improvement General But Slow in Developing —Combines Continue to Hold Stage

BERLIN, GERMANY, July 23.—Although the general industrial situation improves slowly, 1,750,000 persons are still unemployed. The cabinet is raising 200,000,000 marks for relief work, to consist mainly of railroad enterprises, including bridging, which will materially help the steel situation. As a result of the British strike the coal industry on the Ruhr is booming. The last week recorded shows average daily output of 366,596 metric tons, the highest recent figure. The average for 1913 was 379,840 tons. The large unsold stocks of Ruhr coal have declined materially.

Tube Syndicate Organized

The International Tubes Syndicate (of German, French, Luxemburg and Belgian tube producers) has been completed and is retrospectively dated from June 1, for a term of three years. Selling will be conducted by the separate syndicates of the territorial groups, no central selling bureau being planned. Orders obtained thus will be mutually communicated, the matter being so regulated that no country will get more nor less than its quota. Export prices for tubes have already been increased, and a further increase is expected. The existing Central-European tubes agreement with Czechoslovakia is amalgamated in the new syndicate. Participation of British manufacturers is doubtful.

Amalgamations of the new Steel Trust (Vereinigte Stahlwerke, A.-G.) continue, but many of the reported projects are baseless. Despite rumors, Krupp and the Mannesmann Tubes Co. will remain outside, also probably the Gutehoffnungs Hütte. The trust has come to an agreement with the Rombach Hüttenwerke for purchase of the latter's smelting establishments in Bochum, Engers and Rendsburg at about 20,000,000 marks. With the Stumm Concern the Steel Trust has concluded leasing agreements for 30 years, covering real estate and production apparatus, which it will conduct, and it will buy the concern's stock in hand. Provision will probably be made for complete purchase of the Stumm works within the leasing term. The lease rent will have a fixed relation to the dividend

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British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.86 per £ as follows:

Durham coke, f.o.b..	£2	7½s.	to £2	12½s.	$11.54	to	$12.76
Bilbao Rubio ore†	1	1	to	1	1¼	5.10	to	5.16
Cleveland No. 1 fdy.	4	12½	and	4	13*	22.48	and	22.60*
Cleveland No. 2 fdy.	4	10	and	4	10½*	21.87	and	22.00*
Cleveland No. 3 fdy.	4	9	and	4	9½*	21.63	and	21.75*
Cleveland No. 4 forge	4	8½	and	4	9*	21.50	and	21.62*
Cleveland basic (nom.)	3	15	and	3	15½*	18.23	and	18.35*
East Coast mixed	4	1	and	4	2*	19.68	and	19.92*
East Coast hematite	3	16	to	3	16½	18.46	to	18.58
Ferromanganese	15	0				72.90		
*Ferromanganese	14	0				68.04		
Rails, 60 lb. and up	6	15	to	7	5	32.80	to	35.23
Billets	6	10	to	8	0	31.59	to	38.88
Sheet and tin plate bars, Welsh	6	5				30.37		
Tin plates, base box	1	0	to	1	5	4.86	to	6.07
Black sheets, Japanese specifications	13	10	to	14	0	65.60	to	68.04
						C. per Lb.		
Ship plates	7	5	to	7	15	1.57	to	1.68
Boiler plates	9	5	to	11	0	2.00	to	2.39
Tees	7	10	to	8	0	1.62	to	1.73
Channels	6	15	to	7	5	1.46	to	1.57
Beams	6	10	to	7	0	1.41	to	1.52
Round bars, ¾ to 3 in.	7	12½	to	8	2½	1.65	to	1.76
Steel hoops	10	10	and	11	0*	2.28	and	2.39*
Black sheets, 24 gage	11	0	to	11	5	2.39	to	2.44
Galv. sheets, 24 gage	16	10				3.58		
Cold rolled steel strip, 20 gage	18	0				3.91		

*Export price.
†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

Foundry pig iron: (a)								
Belgium	£2	10s.			$17.01			
France	3	10			17.01			
Luxemburg	3	10			17.01			
Basic pig iron: (a)								
Belgium	3	3			15.31			
France	3	3			15.31			
Luxemburg	3	3			15.31			
Coke	0	18			4.37			
Billets:								
Belgium	4	13	to	£4	15s.	22.60	to	$23.08
France	4	13	to	4	15	22.60	to	23.08
Merchant bars:						C. per Lb.		
Belgium	4	17½	to	5	0	1.06	to	1.08
Luxemburg	4	17½	to	5	0	1.06	to	1.08
France	4	17½	to	5	0	1.06	to	1.08
Joists (beams):								
Belgium	4	17½	to	5	0	1.06	to	1.08
Luxemburg	4	17½	to	5	0	1.06	to	1.08
France	4	17½	to	5	0	1.06	to	1.08
Angles:								
Belgium	5	2	to	5	4	1.10	to	1.13
⅛-in. plates:								
Belgium	5	10	to	5	12½	1.19	to	1.22
Germany	5	10	to	5	12½	1.19	to	1.22
⅜-in. ship plates:								
Belgium	5	5	to	5	10	1.14	to	1.19
Luxemburg	5	5	to	5	10	1.14	to	1.19
Sheets, heavy:								
Belgium	6	2	to	6	4	1.33	to	1.34
Germany	6	2	to	6	4	1.33	to	1.34

(a) Nominal.

paid by the trust. The leased works include the Eisenwerk Kraft A.-G., at present capitalized at 18,750,000 marks, and the Langendreer and Schwerte works.

Better Conditions Noted

General though slight improvement in iron and steel is accompanied by increased activity in scrap iron, and prices of scrap have risen. Latest prices, c.i.f. any Rhenish-Westphalian smelting works, are:

	Marks per Metric Ton	Per Gross Ton
Steel scrap	About 52 to 53	$12.58 to $12.72
Solid scrap	About 51 to 52	12.34 to 12.58
Turnings for blast furnaces	About 43 to 44	10.41 to 10.65
Machine castings scrap	About 55 to 60	13.31 to 14.52

The Pig-Iron Syndicate will retain its prices and selling conditions in August unchanged. The latest franc collapse has made French competition more severe. The English strike has not so far appreciably affected the German market, and conditions are not yet satisfactory. Syndicate prices for pig iron are as follows:

	Marks per Metric Ton	Per Gross Ton
Foundry iron No. 1	88	$21.30
Foundry iron No. 3	86	20.81
Hematite	93½	22.63
Siegerland steel-making iron	88	21.30
Spiegeleisen, 6 to 8 per cent manganese	102	24.68
Ingots	104	25.17
Blooms	111½	26.98
Billets	119	28.80
Slabs	124	30.00
Bars	134	32.43
Structural iron	131	31.70
Bands	154	37.27
Thin sheets, 1 to 3 mm. (No. 20 to No. 11½)	145	35.09
Thin sheets, under 1 mm.	155 to 150	$37.51 to 36.30

In the steel semi-finished and rolling mill branches the improvement is undoubted. The works, whose ratio for July was increased from 65 to 67½ per cent of full productive capacity, have enough orders for the increased ratio. Here the activity is partly due to the English coal strike. French dumping is bound soon to cease, as the French works are selling more and more on a gold franc basis. German works report increasing English demand for semi-finished materials.

Export of structural forms is dull and the home market has hardly improved. There is a slight increase in orders for railroad material and a considerable increase in the demand for mine rails, this owing to the improved coal condition. Export of heavy rails is increasing. The home market for bars has improved, and the delivery term has increased to three or four weeks. Export of bars is satisfactory and everything on hand can be sold, though at unsatisfactory prices; midsummer always brings an increase in the demand for bars. The export market for bands is weak, the home market being slightly better.

Sheets and Wire

For sheets both the home and the export markets have improved. The export of thick sheets is increasing, as the low franc exchange has brought the French and Belgian works orders which exceed their output capacity. Orders for thin sheets are increasing at practically the old prices. The export demand is materially greater. Since the recent understanding in the wire industry export of drawn wire is much more active, and prices have risen by about 1s. (24c.) per ton. The improvement extends to wire rods. Screw and rivet wire is in increased demand.

Great hopes are set up on receipt of Railroad Corporation orders for steel rails and other permanent-way materials. A first order already sanctioned is for 50,000 tons, with an option to buy a further 150,000 tons. This order has been given to the Stahlwerksverband, which is also considering a big deal with Yugoslavia. The Yugoslav Ministry of Communications is stated to be about to purchase rails for 1000 km. (621 miles) of track. As there are objections against ordering these rails from Germany on reparations' account, the plan is to finance the deal with a loan. The German Railroads Corporation has ordered 127 locomotives, distributed among the different works by the lately founded Syndicate of German Locomotive Manufacturers, an organization consisting of all the 19 important firms.

Machine manufacturers are occupied to only 60 per cent of capacity, according to a statement of the syndicate. Both home demand and export have increased. The syndicate predicts continuing unemployment in machinery and engineering.

POLISH IRON AND STEEL

British Strike Helps Coal Mines—Syndicates in Domestic and Export Steel Markets

BERLIN, GERMANY, July 28.—Poland's coal industry has benefited enormously from the English strike, according to information direct from Warsaw. Her iron and steel industry has begun to feel the benefit of the general European revival and is having success in eastern Europe in competition with Czechoslovakia. Polish Upper Silesia's coal output in 1925 was 21,433,630 tons. The average monthly output in the first months of this year was about 1,600,000 tons, but the exports alone in June, as a result of the English strike, reached nearly 1,400,000 tons, or double the exports of May. Nearly 300,000 tons went to England. In the second quarter of 1926 Poland exported twice as much coal as in the last quarter of 1925. The chief gainers were the Upper Silesian mines. In late June Poland contracted to sell coal to the Russian railroads, the Baltic fleet and the mills of North Russia, which before the war depended upon British coal.

Combination the Order of the Day

The chief event in Poland's iron and steel industries this year was the creation of an All-Polish syndicate, which is the result of an agreement between the works of Old Poland and the new works gained through the cession of Upper Silesia. For a time the important Sosnowice Iron & Tubes Works opposed the syndicate, with Government support. On May 6 the Sosnowice Works joined the syndicate, which is a selling syndicate in the narrow sense of the word, its only aim being to regulate sales at home. It dates from Jan. 1.

Since May 6 the participation quotas of the constituent companies have had to be altered, owing to the entry of Sosnowice, which is the third most important concern in the production of semi-finished materials, fourth in bars, and first in universal iron and thick sheets. In semi-finished material the Bismarckhütte has approximately a 65 per cent quota, the Königsund-Laurahütte 22 per cent and Sosnowice 8 per cent. In bars Königsund-Laurahütte has 22 per cent, and Bismarckhütte 19 per cent; in universal iron, Sosnowice has 49 per cent and in thick sheets 29 per cent. In thin sheets Bismarckhütte and Friedenshütte have each about 30 per cent of the total quotas. The Upper Silesian works taken together have 91 per cent of the quotas of semi-finished materials, 60 per cent of bars and bands, 59 per cent of thick sheets, and 82 per cent of thin sheets.

An "export company of Polish iron-works" has been formed, consisting of four works in the Province of Kielce, and one each in Upper Silesia and Krakau Province. The iron and steel situation has become more stable since the formation of the syndicate. Home sales have fluctuated very little in the past three months. Exports, as a result of close relations with Austria, Hungary, Bulgaria, Yugoslavia and Rumania, and as a result of the acceptance of unprofitable orders, have greatly increased. In Rumania in particular Czechslovakian competition has been defeated. Only the big Polish works have benefited from this.

The American Ceramic Society will hold its summer meeting at the Bellevue-Stratford Hotel, Philadelphia, Aug. 30 to Sept. 2, inclusive. Ross C. Purdy, Lord Hall, Ohio State University, Columbus, Ohio, is general secretary.

HEAVY GAIN TO FAR EAST

American Iron and Steel Exports 75 Per Cent Above First Half of 1925—Japan Takes Over Half of Total

WASHINGTON, Aug. 9.—Aggregating 233,399 gross tons, exports of iron and steel products to the Far East during the first six months of 1926 showed an increase of 99,869 tons, or 75 per cent, over the figure for the corresponding period of last year, when the total was 133,530 tons, according to Marshall T. Jones, assistant chief, iron and steel division, Department of Commerce. The Far East includes India, British Malaya, Ceylon, China, Java, Madura, other Dutch East Indies, Hongkong, Japan and Chosen, Philippine Islands, Siam, Australia and New Zealand. The only decrease in 1926, a slight one, was in shipments to China, attributed to the Chinese boycott of Hongkong.

Mr. Jones points out that 1925 did not represent a normal year, and that shipments to Japan for the first six months of last year were less than half of those in either 1923, 1924 or 1926, due chiefly to the fact that exchange was low.

1926 Ahead of 1923-24-25 Average

Shipments to the Far East in 1926 exceeded those in any of the foregoing years except in 1924. That was an abnormal year, due to the fact that, of the 165,587 tons sent from the United States to Japan in the first six months, 140,406 tons were dispatched during January and February, to reach Japan before March 31. At that date the duty was again assessed, which had been lifted on all steel products considered as construction materials, as an aid to the rebuilding of the stricken areas after the earthquake. The table gives exports to the Far East for the first six months of the years 1923 to 1926, inclusive.

Exports to the Far East of Iron and Steel Products from the United States
(In Gross Tons)

Destination	January Through June			
	1923	1924	1925	1926
India	10,843	15,143	3,646	18,549
British Malaya	2,221	2,072	2,726	4,813
Ceylon	105	135	40	63
China	22,887	47,689	17,556	17,263
Java and Madura	1,325	4,010	3,820	4,948
Other Dutch East Indies	1,814	12,631	4,526	11,562
Hongkong	7,173	8,284	2,386	890
Japan and Chosen	145,160	165,587	57,031	130,340
Philippine Islands	14,770	27,687	24,297	30,457
Siam	25	1	62	87
Australia	21,354	9,003	11,461	12,418
New Zealand	2,573	987	950	2,004
Total	230,250	293,229	133,530	233,399
Total to all countries	971,585	992,860	842,295	1,028,583
Percentage to Far East.	23.7	29.5	15.85	22.7

As the table indicates, Japan (with Chosen) made by far the leading consuming country of the Far East taking iron and steel products from the United States. The following table shows shipments to these countries of the principal products during the first six months of the four years covered:

Exports from the United States to Japan and Chosen of Principal Iron and Steel Products
(In Gross Tons)

Article	January Through June			
	1923	1924	1925	1926
Scrap	6,372	2,713	3,354	10,301
Wire rods	6,169	3,932	4,913	2,974
Black steel sheets	16,464	56,367	10,968	50,749
Tin plate	17,059	20,413	17,022	23,938
Rails and accessories	47,285	33,479	2,972	14,168
Welded pipe	17,005	13,306	8,477	11,608
Wire and manufactures of.	12,291	4,054	502	845
Wire nails	5,534	8,882	13	70
Other products	16,980	22,442	8,810	15,687
Total	145,160	165,587	57,031	130,340

GERMAN STEEL EXPORTS

Total for Five Months More Than Double That from United States

BERLIN, GERMANY, July 23.—Foreign trade in the first five months of this year was strongly active in coal, in iron and steel goods of all kinds taken together, and in machinery. The figures are in metric tons:

	January to May, 1926	
	Imports	Exports
Coal	1,900,274	6,551,885
Iron and steel and wares thereof	378,090	2,085,288
Of which:		
Pig iron	39,367	158,453
Scrap iron, etc.	28,039	195,150
Ingots, etc.	78,273	103,536
Bars, etc	119,666	461,748
Sheets	11,937	199,768
Wire	19,749	195,237
Tubes	1,383	128,010
Rails, etc.	42,466	199,087
Machinery	15,129	185,040

The German exports in five months, at 2,085,288 metric tons, were more than double the American total of 869,077 (gross) tons (883,000 metric tons). Compared with some of the items in the table, American exports were as follows:

	Gross Tons		Gross Tons
Pig iron	7,747	Sheets and tin plate	273,126
Scrap	49,906	Wire, etc.	50,149
Ingots, etc.	24,493	Tubes, etc.	131,808
Bars, etc.	63,473	Rails, etc.	74,177

British Said to Have Withdrawn from European Steel Entente

WASHINGTON, Aug. 10.—Because of failure to agree with regard to its production quota, England is reported to have withdrawn from negotiations for a European steel entente. The pool now includes France, Germany, Belgium and Luxemburg, according to a cablegram received from Commercial Attaché Jones, Paris, by the Department of Commerce. The German Government, it is stated, favors participation on the part of its rail industry in order to recover its foreign markets at higher prices. It is also reported that France desires to maintain its expanded trade at the higher price levels which will prevail under the entente.

Belgium is said to look favorably on an entente, but the Charleroi producers present an obstacle to a final consummation by disputing their production quota. The general basis for the entente involves production quotas on steel ingots for each country, with complete freedom regarding tonnages sold abroad provided the prices determined upon are maintained. It is generally agreed that this will result in substantially increased prices on foreign sales and a probable reduction in domestic prices. While the cable says that the negotiations are understood to be making good progress, in well-informed circles it is believed that the reported date of Aug. 12 as the time of signature is premature.

German Pig Iron Output Lower

BERLIN, GERMANY, July 23.—Production of pig iron in June declined slightly to 720,081 metric tons, compared with 736,206 tons in May and with 941,201 tons in June of last year. For the first six months production has been 4,161,974 tons, compared with 5,571,878 tons last year.

Polish Pig Iron Production Lags

BERLIN, GERMANY, July 28.—Poland's pig iron industry has not yet fully recovered from the war troubles. Production figures, in metric tons, are as follows:

	1913	1923	1924	1925
In East Upper Silesia	1,164,474	878,412	520,842	228,037
In Old Poland	600,258	249,558	151,955	.....
Total	1,764,732	1,127,970	672,797	228,037

Complete pig iron figures for 1925 have not yet appeared. Steel production in Upper Silesia in 1925 was 533,605 tons; rolled goods, 429,710 tons, and finished metal manufactures, 197,348 tons.

The Interstate Commerce Commission has issued an order suspending until Nov. 18 railroad tariffs proposing to reduce rates on ex-Lake iron ore, in carloads, from Chicago to Granite City, Ill., from $1.40 to $1.20 a gross ton.

MALLEABLE CASTINGS CASE

Federal Action Closed by Fining of 87 Companies and Individuals

Forty-eight company members of the American Malleable Castings Association, comprising 87 separate defendants, were fined $2,500 each, a total of $217,500, in Federal Court in Cleveland on Aug. 6, when they entered pleas of nolo contendere in the suit of the United States Government for alleged violation of the anti-trust laws. Several weeks ago five of the original 95 defendants entered pleas and were fined a total of $14,500, bringing the total of the fines to $232,000.

By their pleas of nolo contendere the defendants do not admit their guilt, but the legal effect is the same. The indictment on which the malleable castings manufacturers were brought to trial was returned by a Federal grand jury in Cleveland in March, 1924.

Herbert Pope, Chicago, on behalf of the indicted foundrymen, gave an extended outline of the work and achievements of the American Malleable Castings Association. He explained how through control and direction of technical processes and by means of an extensive campaign of education, manufacturing operations were placed upon a more efficient basis, and uniformity in the physical properties of malleable iron was attained. This steady improvement in quality, he said, restored trade confidence in malleable castings and largely was responsible for building up the entire industry to its present proportions.

Touching upon market conditions, Mr. Pope said that the railroads and automotive builders are the principal buyers of malleable iron and that at the time the Government declared the defendant companies were fixing prices, the fact is these two big buying groups were dictating the prices they would pay for malleable castings.

Rather than prolong the legal struggle, which also was becoming increasingly expensive, on July 1 of this year A. E. Shaw, representing Stanley G. Flagg & Co., Inc., Philadelphia, appeared in the federal court at Cleveland, entered a plea of nolo contendere and was fined $3000 and the costs, and the company was fined like amounts. On July 2, E. F. Leigh, representing the Marion Malleable Iron Works, Marion, Ind., also entered a plea of nolo contendere and he and his company were each fined $3000 and the costs. The trial of the other defendants was set for Sept. 13 at Cleveland, but now the matter has been closed up, or will be when the remaining defendants come into court, plead and are fined similarly, as it is expected they will do.

New Federal Trade Commission Member Takes Office

WASHINGTON, Aug. 9.—Abram F. Myers, republican, of Iowa, has taken the oath of office as a member of the Federal Trade Commission, succeeding Vernon W. Van Fleet, republican, resigned. Mr. Myers was given a recess appointment by the President after Mr. Van Fleet had requested to be relieved of his position. Two years of the term remain unexpired.

Mr. Myers's appointment was a surprise, seeing that another member, Charles W. Hunt, so-called progressive republican, is also from Iowa.

The iron and steel and related industries, practically from the time the commission was set up, have had cases pending before it. The proceeding of greatest importance to the steel industry now being subjected to inquiry by the commission is that of the so-called Bethlehem-Midvale-Lackawanna merger. Disposition of the case necessarily rests upon the personnel of the commission. It is about to undergo further changes, which will leave a purely Coolidge organization.

Under the law not more than three of the five members of the commission shall be of the same party. The third republican member is Commissioner Humphrey. The term of Mr. Thompson will expire in September. It is understood that he has senatorial aspirations. It is said also that Mr. Nugent contemplates a return to the Senate. Successors to Mr. Thompson and Mr. Nugent are expected to be appointed by Mr. Coolidge with a view to bringing to an end the dissension that has existed in the commission.

Mr. Myers comes to the commission from the Department of Justice and is reputed to be a lawyer of unusual qualifications, especially with regard to the anti-trust laws. He came to Washington in 1910, having been selected by Judge William S. Kenyon to serve as a law clerk in the Department of Justice at the time Judge Kenyon was associated with the department in charge of anti-trust proceedings.

Mr. Myers, who is 37 years of age, was graduated from Georgetown University in 1912. He has served in several capacities in the Department of Justice under Attorneys-General Wickersham, McReynolds, Gregory, Palmer, Daugherty, Stone and Sargent. He had charge of the so-called "anthracite" suits against the Reading and Lehigh Valley railroads, which resulted in severance of the railroads from the coal mines which they had owned. He also directed the Standard Oil "cracking cases" and the case against the Ward Baking Co.

Work Begun on $6,000,000 Motor Car Plant

Work has been started by the Austin Co., Cleveland, on a $6,000,000 automobile manufacturing plant for the Oakland Motor Car Co. at Pontiac, Mich., to be devoted to the manufacture of Pontiac cars. The new plant will have more than 2,000,000 sq. ft. of floor space, with the following buildings to be built at this time: A motor plant of single story design, 455 x 880 ft.; an assembly building, 180 x 1260 ft., three stories and basement; a foundry, 300 x 700 ft., and a car storage building, 432 x 760 ft. The plant will require 12,000 tons of structural steel, 500,000 sq. ft. of steel sash, six miles of mechanical sash operating equipment, as well as large quantities of other materials. Work will be completed in January, 1927. The plant of the Fisher Body Co. is located on adjacent property and bodies from the Fisher plant will be moved to the Oakland plant on conveyors.

Concrete Reinforcing Steel Institute to Meet

Concrete Reinforcing Steel Institute, Tribune Tower, Chicago, announces its semi-annual meeting to be held Sept. 13, 14 and 15 at French Lick Springs Hotel, French Lick, Ind. The opening session will be devoted to reports by the president and various committees. The morning session of Sept. 14 will be addressed by Edward L. Soule, San Francisco, on "Conditions on the Pacific Coast." At the afternoon session A. E. Lindau of the American System of Reinforcing, Chicago, will address the institute on "The Development of Concrete Reinforcement." No formal meetings of the institute are scheduled for Wednesday, Sept. 15, and it is planned that a golf tournament will be played during the afternoon of that date.

Patent Office Models Go to Wire Company's Museum

The American Steel & Wire Co. has received from the Patent Office 148 models having to do with the wire industry, which will be placed in the company's Industrial Museum at Worcester, Mass. The museum was established in 1908 and in it has been brought together a collection of equipment and products which constitutes a graphic picture of the American wire industry from its very beginning.

Early in 1925 the Patent Office, under act of Congress, began the disposition of the enormous accumulation of models, which in the old days it was necessary to file with applications for patent. They numbered several hundreds of thousands. Congress provided that museums might be favored with such models as appropriately belonged in them, and the American Steel & Wire Co., through Arthur G. Warren, secretary of its museum committee, made application for those pertain-

ing to the wire industry. The 148 models will not take much space, for most of them are small. They include 70 curious designs of barbed wire, of which the museum already has on display some 140 models. Most of the Patent Office accumulations have already been disposed of as junk. More than 100,000 models have been auctioned off; but none pertaining to wire have thus been lost.

Progress in New England Industrial Survey

WASHINGTON, Aug. 10.—The commercial and industrial survey of New England being conducted by the Department of Commerce with the assistance of the New England Council, in an effort to determine the present and potential marketing possibilities of the area, is progressing satisfactorily, according to a report just made by Dr. C. B. Artman to Director Julius Klein of the Bureau of Foreign and Domestic Commerce. Dr. Artman is supervising the field work. A statement issued by the department says that cooperation by all branches of industry and agriculture in New England has resulted in the return of approximately 25 per cent of the questionnaires distributed throughout the six States.

Handbook on the Junior Beam

A new booklet describing the "J & L Junior Beam" has been issued by the Jones & Laughlin Steel Corporation, Pittsburgh. It will furnish builders, engineers and architects with working tables and other data in the application of the new junior beam to all uses in construction, especially for floors and roofs in office buildings, hotels, hospitals, schools, apartments, farm buildings, garages and other large structures, as well as dwelling houses. The booklet, called Bulletin No. 2, contains 56 pages and is a complete handbook on the new structural product, which is a rolled steel beam—not fabricated, welded, or otherwise worked upon after its initial rolling.

One feature of the booklet is a letter from Prof. Milo S. Ketchum of the University of Illinois, reporting the favorable results of his tests of the new beam, in 6-in., 10-in. and 12-in. sizes. Other features are complete description, with illustrations, showing manner of support, use for floor beams, as roof purlins and rafters, suggested specifications, tables of spacings and safe loads and fabrication details.

The new J & L junior beam, which is made in 7-in., 8-in., 9-in. and 11-in. depths, in addition to those listed above, has been hailed as a possible factor in hastening the era of the "all-steel" house. This feature is being studied carefully by the Jones & Laughlin engineers, who will shortly have data available on this application of the new structural product.

Dorr Co. to Make Fahrenwald Sizer

The Dorr Co., engineer, 247 Park Avenue, New York, has taken over the manufacturing and selling of the Fahrenwald sizer, an hydraulically operated machine that was developed by A. W. Fahrenwald, of the Bureau of Mines.

The applications of the sizer are briefly summed up as follows by the Dorr Co.:

It will take an unsized feed in which the particles are of uniform specific gravity and deliver a number of closely sized products. It will take an unsized feed in which the particles are not of uniform specific gravity and will deliver a series of hydraulically classified products. It will take a sized feed in which the particles are not of uniform specific gravity, and separate the particles according to specific gravities, or in other words, make a concentration.

The sizer is a six-pocket machine, the compartments having straight, non-sloping sides so that the velocity of the hydraulic water is uniform over the whole area. The spigot discharge valve is controlled by a diaphragm, sensitive to every change of conditions in the classifying pockets, this to insure automatically uniform quality of the spigot products. Little hydraulic water is required, it is stated, and once adjusted the sizer is automatic in operation and, it is added, will even start up after a shut down without supervision. The machine is thus designed to cover problems of sizing, sorting, concentration or separation.

Japan's Electric Wire Industry Expands

WASHINGTON, Aug. 10.—Japan has 11 companies engaged in manufacturing electric wire, and their production of wire and cable in 1924 amounted to $43,736,300, as against $24,156,500 in 1919 and $2,941,500 in 1909, according to a report received by the Department of Commerce from Consul General Edwin L. Neville, Tokio.

The total capitalization of the 11 companies is $16,145,000. These manufacturers are reported to have shown particular skill in the production of various lines of small and medium-gage copper wire, both bare and insulated. The report says that a great stimulus was received by the industry as a result of the decreased imports of foreign-made wire during the World War.

The report adds:

> The manufacture of submarine telegraph and telephone cable has not been so greatly developed as has the manufacture of wire. It is believed in Japan, however, that cable of this kind for home use will ultimately be manufactured entirely in that country. Domestic manufacturers of electrical wire not only supply practically the entire home consumption, but export a considerable quantity to China, Kwantung leased territory, Hongkong and Dutch Indies. The total value of insulated electric wire exported in 1925 was $584,600.

COMING MEETINGS

September

American Ceramic Society. Aug. 30 to Sept. 2, inclusive. Summer meeting, Bellevue-Stratford Hotel, Philadelphia. Ross C. Purdy, Lord Hall, Ohio State University, Columbus, general secretary.

Institute of Metals. Sept. 1 to 4. Autumn meeting, Liège, Belgium. G. Shaw Scott, 36 Victoria Street, London, secretary.

New Haven Machine Tool Exhibition. Sept. 7 to 10. Sixth annual meeting, Mason Laboratory, Yale University, New Haven, Conn. H. R. Westcott, 400 Temple Street, New Haven, chairman exhibition committee.

Lake Superior Mining Institute. Sept. 8 and 9. Twenty-fifth annual meeting, Ironwood, Mich. A. J. Yungbluth, Ishpeming, Mich., secretary.

Concrete Reinforcing Steel Institute. Sept. 13 to 15. Semi-annual meeting, French Lick Springs Hotel, French Lick, Ind. M. A. Beeman, 2112 Tribune Tower, Chicago, secretary.

Ohio State Foundrymen's Association. Sept. 16 and 17. Annual meeting, Hotel Sinton, Cincinnati.

American Society for Steel Treating. Sept. 20 to 24, inclusive. Eighth annual convention and national steel and machine tool exposition, Drake Hotel, Chicago. W. H. Eisenman, 4600 Prospect Avenue, Cleveland, secretary.

Society of Automotive Engineers. Sept. 21 to 23. Annual production meeting, Hotel Sherman, Chicago. John Warner, 29 West Thirty-ninth Street, New York, manager meeting arrangements.

American Foundrymen's Association. Sept. 27 to Oct. 1. Thirtieth annual convention and second International foundrymen's congress, Book-Cadillac Hotel, Detroit. C. E. Hoyt, 140 South Dearborn Street, Chicago, secretary-treasurer.

SUSPENDS DUTY ON INDIAN IRON

Proposed Countervailing Charge Not to Be Made, Only Regular Duty

WASHINGTON, Aug. 10. — The Customs Division, Treasury Department, yesterday made public an order signed last Friday, which suspends the proposed countervailing order applying on imports of pig iron from the Tata Iron & Steel Co., India. Directions were given in the letter, addressed to the collector of customs, New York, to proceed with liquidation of entries from that company without the imposition of any countervailing duty, and to proceed with other entries as they reach the United States. This has the effect of permitting all imports of pig iron from the Tata works to enter the markets of the United States since the original order, April 16, at the regular duty of 75c. per ton and without any retroactive feature, so that they are now on the same basis as other imports of pig iron.

The suspension order places the situation practically where it was when Eastern merchant blast furnace interests protested against imports of pig iron from the Tata works and claimed they should be subjected to a countervailing duty by reason of the fact that the Indian government pays a bounty of 12 rupees per gross ton, now equivalent to $4.32, on 70 per cent of the steel ingot production of that country. It was contended that the subsidy paid on ingots was an indirect bounty on pig iron.

The department found difficulty in reaching a basis for establishing the countervailing duty and finally two weeks ago called in representatives of the domestic blast furnace interests affected, who submitted a formula for arriving at the duty. This formula provided for the lumping together of the production of ingots and pig iron in India last year and dividing the total into the amount of the subsidy paid on 70 per cent of the ingot output, placed at 3,000,000 rupees. This worked out to an amount of practically $1.44, which would have been the countervailing duty, and to which would be added the regular duty of 75c. a ton, the two aggregating $2.19.

It is understood that the customs division was agreeable to the principle of the formula as a means of reaching a decision as to the duty, especially in view of the plan of importers to take the case to court in any event. But the decision suspending the order followed because it is claimed the customs division was not satisfied that the figures submitted were accurate. This is said to be based on two main contentions, one that the subsidy prevailed only part of last year and the other that the amount of the bounties may have included those paid on steel rails as well as on ingots. The plan now is to make further inquiry through the American Consul General in Calcutta, who, the suspension order indicates, may be able to get figures as to the bounties paid on ingots and charged back to pig iron, from the books of the manufacturers. The case thus goes back through State Department channels and if the duty is finally reapplied it is apparent it will be some time before it is done. Meanwhile the imports from the Tata works will be liquidated at the regular duty of 75c.

EUROPEAN STEEL CARTELS

Further Details of the Rail and Steel Tube Associations

WASHINGTON, Aug. 10. — Reorganization of the European rail comptoir and establishment of a European steel tube cartel are about to be effected, according to reports received by the Department of Commerce from Trade Commissioner Daniel J. Reagan, Paris.

The report concerning reorganization of the European Rail Manufacturers' Association credits authoritative French iron and steel trade publications with the statement that it is generally expected in Europe that at the association's next meeting to be held this month the final signature will formally reestablish this organization. During the recent negotiations at London it was decided to establish £6 per ton as the price for heavy rails. The pound sterling being at par ($4.86), this amounts to $29.16.

As previously reported, said Mr. Reagan, this cartel will be known as the "Erma" instead of the "Irma," and to all appearances will have a European rather than an international character. The association will have an initial duration of two years. The controlling body will be established at London, and will include four delegates, an Englishman, a Frenchman, a German and a Belgian.

All of the orders for rails received by the four countries in this accord will be transmitted to the bureau at London, which will then farm out the demands according to the quotas, it is said. It is further stated in Europe that apparently the principal obstacle to the final conclusion of the cartel has been the difficulty in satisfying the demands of the English members, who have held out for the exclusive right to furnish the rail needs of the British dominions. It is reported that this difficulty was finally overcome by deciding that the other countries would not be permitted to sell rails to South Africa or British India until after the English industry had received sufficient orders to fill its quota.

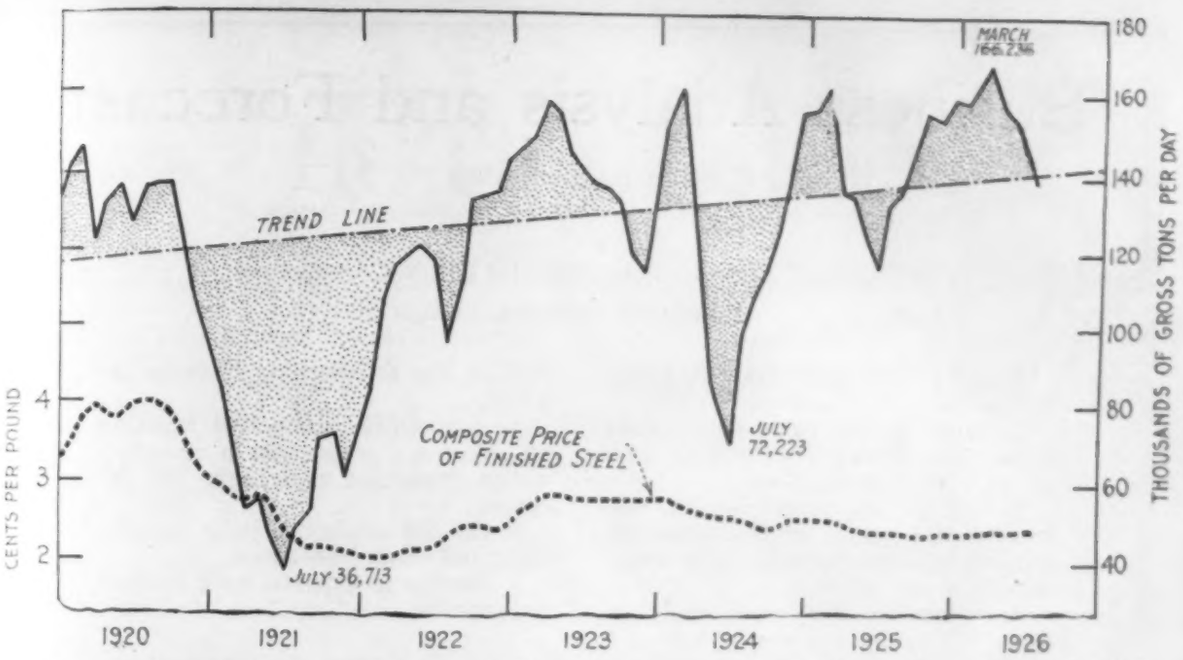
International Tube Association

A recent meeting of the European tube producers interested in the formation of a cartel was held at Düsseldorf to ratify the proposed accord for the international tube association, the report states. Although the general terms were agreed upon, this accord has not yet been signed, but in authoritative circles in France it is considered merely a formality which will be arranged shortly. Apparently this agreement is not really for the establishment of an international tube trust for production control, it is said, but is only an international agreement for the maintenance of prices agreed upon, with each of the countries which are members of the cartel keeping its own independence as regards sales. So far Great Britain, Italy and Spain have not agreed to become members.

Facilitates Water Shipments from Southern Producing Districts

WASHINGTON, Aug. 10.—Authorization last week by the Interstate Commerce Commission to the Inland Waterways Corporation, to purchase all of the stock of the Ensley Southern Railroad for $500,000, provides interest for the iron and steel trade by reason of the fact that, as pointed out by the Department of War, the corporation now will be enabled to handle a barge line from the Warrior River service directly into Birmingham by way of the Birmingham Southern Railroad from Ensley. This barge line has carried a great deal of pig iron from Southern producing districts to points North by water and rail transportation, and it is a question whether or not this traffic will be increased. The War Department statement said that it is estimated that the acquisition by the Inland Waterways Corporation of the stock of the Ensley Southern will increase revenue for the Warrior River barge line sufficiently to pay for the railroad. The road runs from Birmingsport on the Warrior River to Ensley, Ala., a distance of 19 miles, and was owned by the Warrior River Terminal Co.

The War Department also announced that the Waterways corporation has awarded a contract to the Tennessee Coal, Iron & Railroad Co. for 40 steel gondola cars to be used on the newly acquired railroad. A contract also has been awarded by the Mississippi Barge Line Co. to the Midland Barge Co., Midland, Pa., for 11 steel barges, at a cost of $21,500 each, for use on the new upper Mississippi River Barge line. A contract for three towboats for the upper Mississippi previously had been awarded to the Dubuque Boat & Boiler Co., Dubuque, Ia. These towboats will be delivered in the second quarter of next year.



Daily Production of Steel Ingots in July Was About 2.7 Per Cent Less Than in June. The rate falls just below the trend line, which represents average consumption

Small Drop in July Steel Ingot Output

Daily Rate 3831 Tons, or 2.7 Per Cent, Less Than for June—Third Largest July Rate—Twelve-Month Total a Record

THOUGH the July ingot production shows a decline from that of June, it is only a moderate one, with the total impressive in its relative volume. At 140,425 gross tons per day for the 26 working days, the July output was 3831 tons per day less than the June rate, or a decrease of only 2.7 per cent. For the last three months previous to July, this decrease has averaged close to 4 per cent each month. The rate for July is the largest for that month since 1923 and is the third largest July on record, contrasting with 141,258 tons per day in July, 1923, and with 143,520 tons per day in July, 1918.

A new record for 12 continuous months was also made. At 46,584,787 tons the 12 months ended with July exceed the best previous 12-month period—the one ended with June, this year—by over 500,000 tons.

The statistics of the American Iron and Steel Institute show that the July production for the companies which made 94.50 per cent of the country's total in 1925 was 3,450,247 tons. Assuming that the 5.50 per cent not reporting produced at the same rate, a total July output is indicated of 3,651,055 tons, from which the daily rate was calculated. According to the estimates of the institute, July operations were 78.20 per cent of the "theoretical" capacity, compared with 80.34 per cent in June, 84.51 per cent in May, 88.33 per cent in April and 92.58 per cent in March, the peak of the year.

The table gives the reported production by months of the different kinds of steel, together with the estimated daily rate for all companies.

Production of Steel Ingots

(Gross Tons)

Months 1926	Reported by Companies Which Made 94.50 Per Cent of the Steel Ingot Production in 1925			Calculated Monthly Production All Companies	Approximate Daily Production All Companies
	Open-Hearth	Bessemer	All Other		
Jan.	3,326,846	581,683	13,664	4,150,469	159,633
Feb.	3,023,829	556,031	12,818	3,801,776	158,407
March	3,590,791	635,680	15,031	4,488,362	166,236
April	3,282,435	601,037	13,652	4,122,941	158,613
May	3,201,230	516,676	10,437	3,945,336	151,744
June	3,036,162	498,764	9,441	3,750,653	144,256
July	2,911,375	526,500	12,372	3,651,055	140,425
7 mos.	22,372,668	3,916,371	87,415	27,911,592	154,208
1925					
Jan.	3,263,256	689,996	11,960	4,193,281	155,307
Feb.	2,933,225	602,042	12,998	3,752,352	156,348
March	3,337,721	614,860	13,633	4,194,340	161,321
April	2,858,866	515,715	14,182	3,583,676	137,834
May	2,755,561	497,708	13,790	3,454,971	132,883
June	2,540,729	476,945	12,490	3,204,451	123,248
July	2,446,068	457,095	13,547	3,084,472	118,634
7 mos.	20,135,426	3,854,361	92,600	25,467,543	140,705
Aug.	2,698,285	523,734	12,914	3,420,998	131,577
Sept.	2,738,873	547,121	13,977	3,489,565	134,214
Oct.	3,077,114	584,567	15,624	3,888,814	144,030
Nov.	3,092,194	581,347	17,085	3,902,900	156,116
Dec.	3,169,796	569,304	15,843	3,970,918	152,728
Total	34,911,455	6,660,424	183,043	44,140,738	141,932

Lake Ore Movement Expands in July

Shipments of Lake Superior iron ore from the upper Lake ports in July were 9,999,137 gross tons, or 1,467,887 tons larger than in July, 1925. This is an increase of 17.21 per cent. The season's shipments to Aug. 1 amounted to 24,892,936 tons, which contrasts with 26,924,435 tons to Aug. 1, 1925—a decrease of 2,031,499 tons or 7.55 per cent. The shipments by ports and for the season in 1926 and 1925 are as follows:

	July 1926	July 1925	To Aug. 1 1926	To Aug. 1 1925
Escanaba	936,760	801,804	2,738,652	2,601,340
Marquette	640,094	581,665	1,430,686	1,532,481
Ashland	1,323,222	1,004,540	3,223,054	3,124,513
Superior	2,811,117	2,359,441	6,739,772	7,341,909
Duluth	3,169,415	2,871,169	7,945,649	9,292,202
Two Harbors	1,118,529	912,631	2,815,123	3,031,989
Total	9,999,137	8,531,250	24,892,936	26,924,435
Increase	1,467,887			
Decrease			2,031,499	

Of the total season shipments Duluth contributed 31.92 per cent against 34.52 per cent last year. Great Northern's proportion was 23.92 per cent this year against 25.11 per cent last year.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Statistical Data Concerning the Chief Consuming Industries Indicate That:

1. Sales of finished steel are good, but do not reflect *forward* buying.

2. Trend in chief consuming industries again approaches the high rate of steel ingot production.

3. Reduced equipment buying, but coincident lowering of the large car surplus indicates probable early stimulation of car orders.

4. Structural steel sales likely to decline, due to lessening building activity.

5. Automobile production tapering off. Average production in manufacturing industries still high, but declining.

6. Oil and mining activity contributing full quota to demand.

7. Decline in exports, with outlook unfavorable.

JUNE data indicate a small recovery in industrial activity and show that there was some economic reason, after all, for the firmer attitude of steel manufacturers which developed in that month. Larger orders for finished steel were recorded and this, together with the diminishing rate of decline in the unfilled orders of the Steel Corporation, are sufficient statistical evidence to show at least a temporary upturn in the steel industry.

The whole story of steel in recent months lies in two facts: In the first place, the steel ingot production has been considerably above the long-time trend, or above the estimated normal requirements of the country; in the second place, the activity of the chief steel-consuming industries has also been above normal and sufficiently large to support the above-normal steel output. This situation obviously hinges on the continuation of the above-normal requirements of the steel-using industries. So long as these industries continue at their recent high levels, the steel industry itself may go ahead, but if the composite demand for steel declines, a downward readjustment will be required.

Steel Production Slightly Above Demand

OUR composite demand curve for steel, as shown in the first chart, remained higher than the production curve for about a year. It has, however, shown a downward trend since last December, and in May it fell below the production curve. Computations for June indicate a gain in the composite activity of the steel-using industries, but not quite sufficient to bring it back to the level still maintained by the ingot output. This means that the current rate of steel production is a little above the potential demand for steel from those industries which are the chief users of that product—a condition which cannot go on indefinitely. Either production must be curtailed or the steel requirements of industry must expand. What is the outlook?

Railroad freight traffic showed a good gain in June. While the volume was not so large as in March, considering the usual seasonal variations, it was larger than in any other month this year. July freight traffic probably will be a little larger than the June figure. The earnings statements of the railroads have been mostly favorable. In part, however, the gain in earnings has been due to economies; and the economies, in turn, have meant reduced purchases of steel. Certainly the large volume of traffic has not yet been reflected in railroad buying of steel products. Car orders have fallen to low levels and steel plates constitute one of the weak spots in the finished steel markets. While the near future of railroad steel buying does not seem bright, owing to the ample supply and good condition of railroad equipment, *considerable improvement seems probable later in the year. The railroads cannot long continue to handle a growing volume of traffic and show good earnings without coming into the market for steel.* Already we note that the number of surplus freight cars is not only decreasing, but is considerably smaller than a year ago.

Buildings and Automobiles Show Lowering Trend of Activity

FLOOR space in building contracts awarded has shown a continually declining *trend* this year through June. Allowing for seasonal variation, new building contracts in June amounted to 113 per cent of the average of the last five years, against 118 per cent in May and 117

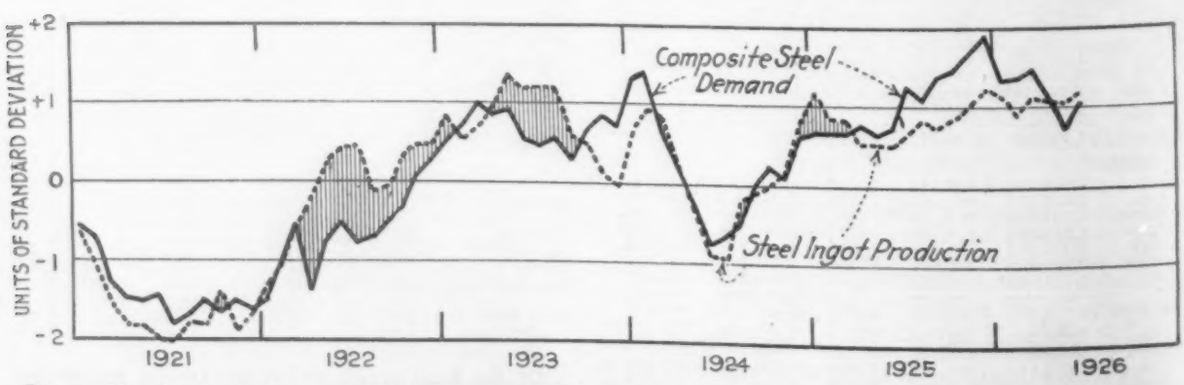


Fig. 1—The Composite Curve of Steel Demand, While Still Below That of Steel Ingot Production, Has Closely Approached the Production Curve, Indicating That Only a Moderate Recession in Ingots, at Most, Is Needed to Maintain a Balance

In This Issue

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Cupola iron may be desulphurized by systematic jolting in a forehearth.—German device accelerates passing off of manganese sulphide, and may be used with advantages for gray iron, malleable and steel casting purposes.—Page 413.

Railroads must soon come in the market for new equipment.—Dr. Haney feels certain that high earnings and decreasing car surplus will bring the demand. Will offset decline in steel consumption by automotive, manufacturing and building industries, and thus there will be no sharp recession in aggregate purchases of steel.—Page 434.

Savings realized in commercial arc welding.—Application of method to building of gas holders and purifiers, tar extractors, straight pipe and fittings said to accomplish cost reduction of 15 to 25 per cent.—Page 421.

Are producers wholly responsible for complaints on galvanized products?—Distributers are blamed for selling sheets that are too light and without a coating of zinc heavy enough for the intended purpose.—Page 418.

July steel ingot output is third largest July on record.—Also, previous record for continuous twelve months is exceeded by half a million tons as result of July production, which is only slightly below June.—Page 433.

Chromium imparts high tensile strength at high temperatures to its alloys.—Nickel adds strength and stiffness and diminishes elongation. Wide field of application of chromium and chrome-nickel alloys is just being opened.—Page 418.

Forming of scale eliminated in bright annealing percolator parts.—Air-gas ratio, accelerated combustion and developed radiation are essential factors in working of furnace for non-ferrous products.—Page 422.

Simplified combustion train accurately determines carbon content of cast iron.—Alabama pipe foundry uses new type of chromic-sulphuric acid bulb in train of low temperature, easily maintained and especially adapted to routine service.—Page 415.

Does purity of zinc influence tenacity of coating in galvanizing?—Annealing is beneficial in some cases and the carbon content of the steel is a factor. Preference of Prime Western over electrolytic zinc is questioned. —Page 419.

Ordinary X-ray examination of welded joints tells nothing of crystalline condition of metal.—Real service of radiographs depends on their accuracy in showing inclusions of gas, slag, oxide and other impurities, cracks or seams and lack of fusion.—Page 412.

Chromium owes oxidation resistance to protective coating formed by initial corrosive action.—Its alloys, expert says, resist oxidation either wet or dry, at low or high temperatures, and may be joined by either gas or electric welding.—Page 416.

Steel Corporation's unfilled orders show first increase this year.—Are higher than at the end of July, 1925, though below any previous month in 1926 except June.—Page 462.

Proposed countervailing duty on Indian pig iron imports suspended.—Only regular 75c. a ton duty applies, but further inquiry is expected.—Page 432.

Shop schools are a sound business investment.—Large companies have passed the experimental stage in this sort of education, and resourceful business representatives have nearly replaced the old type of "drummer" in sales departments.—Page 439.

Big business no longer blamed for high cost of living.—Efficiency of large units has reversed their position of 1910, and people now look to industrial models to improve the weaker companies.—Page 438.

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August 12, 1926

Metallurgy for the Metal Goods Maker

IF it were needed to prove that the manufacturer of metal goods should keep in touch with progress in metallurgy, this issue would be of help. Such a reader would doubtless regard the description of the method of reducing the amount of sulphur in molten iron in the foundry as indirectly interesting and likewise that covering the determination of carbon in pig iron, but let him be the maker of ball bearings, or cutting tools, or automobile parts, or saws or files, to mention some things at random, and he will find suggestions of directly practical value in the commercial classification of chromium alloys, with its listing of typical applications.

In his interest also is the article on examining welds by means of the X-ray, a contribution marking progress in the quest to establish testing methods which prove without destroying. Again, to many of his class, the discussion of the galvanizing problem has a practical bearing. And so on could the fact of the help of the issue be further elaborated.

For News Summary See Reverse Side

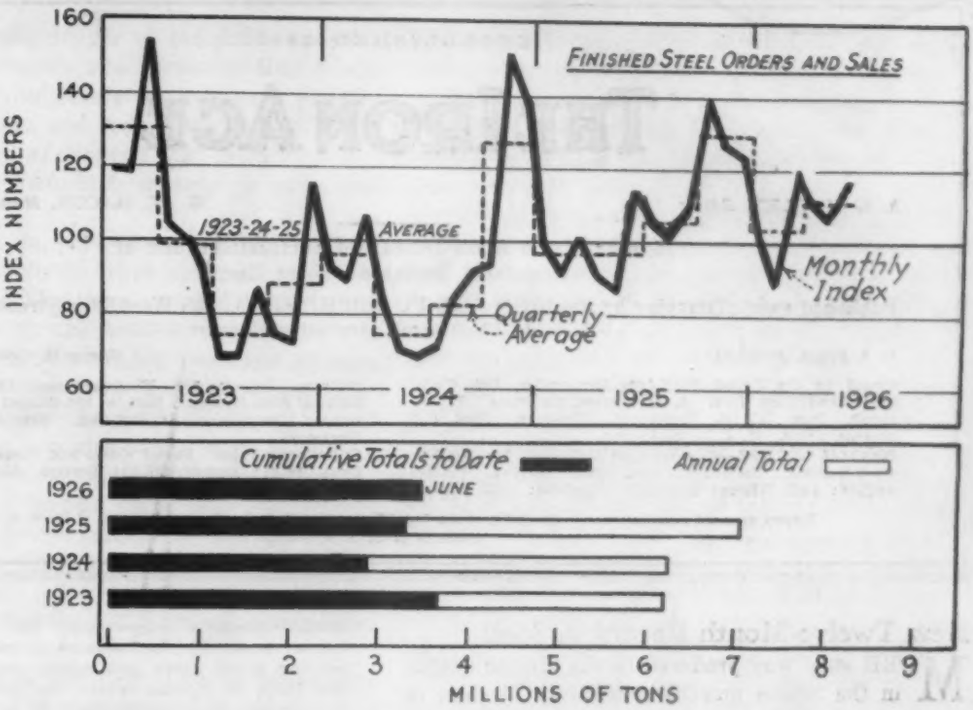

Fig. 2—Finished Steel Orders and Sales Have Done Well So Far This Year. The adjusted monthly index number has maintained its level above previous June figures and the cumulative total is much the largest of any year since 1923

per cent a year ago. This decline has little bearing on the present requirements for building steel, but it does mean a probable reduction in the buying of such steel later on. In fact, a recession in structural steel lettings already has appeared.

That final reports of structural steel sales in July will register a decline is indicated by the fact that weekly bookings have averaged under 25,000 tons during the last five weeks, while the weekly average in June was 31,000 tons and in May 37,500 tons. The tonnage reported a week ago was only 18,000.

Trade reports have it that large fabricating shops are well booked until October, but that they need business to keep them busy after that.

Another sharp decrease occurred in automobile production during June. This was partly seasonal but, even after making allowance for the usual seasonal decline, our adjusted index was only 111 per cent of the five-year average, against 113 per cent in May and 110 per cent a year ago. The automobile manufacturers are taking large quantities of steel and the usual expansion attendant upon getting out new models is being shown. The large activity in producing small, low-priced, all-steel automobiles is notable, and there is doubtless a wide market both among people of small means and among wealthier persons who desire a light, inexpensive second car. We note, however, a continued weakness in the market for sheets and strips. It is a question in the minds of a good many sheet manufacturers whether to continue to produce at a loss or to undergo shut-down losses. Our opinion is that automobile production has seen its peak, but that it will continue in fairly large volume for several months.

There was little change in general manufacturing activity during June, during which month it continued at a high level, though appreciably lower than at the March peak. Machine tool orders, however, increased sharply in June, recovering practically all the ground lost in the slump of April and May. The July volume is reported to have been nearly as good as in June.

Mining and oil activities have contributed their full quota to steel requirements. After a slump in May, June showed sizable increases in bituminous coal, anthracite coal and petroleum. Notably there has been a sharp gain in oil-well drilling activity which, together with the recent uptrend in the average daily production of crude petroleum, has kept the manufacturers of casing and pipe well supplied with business.

(*Concluded on page 460*)

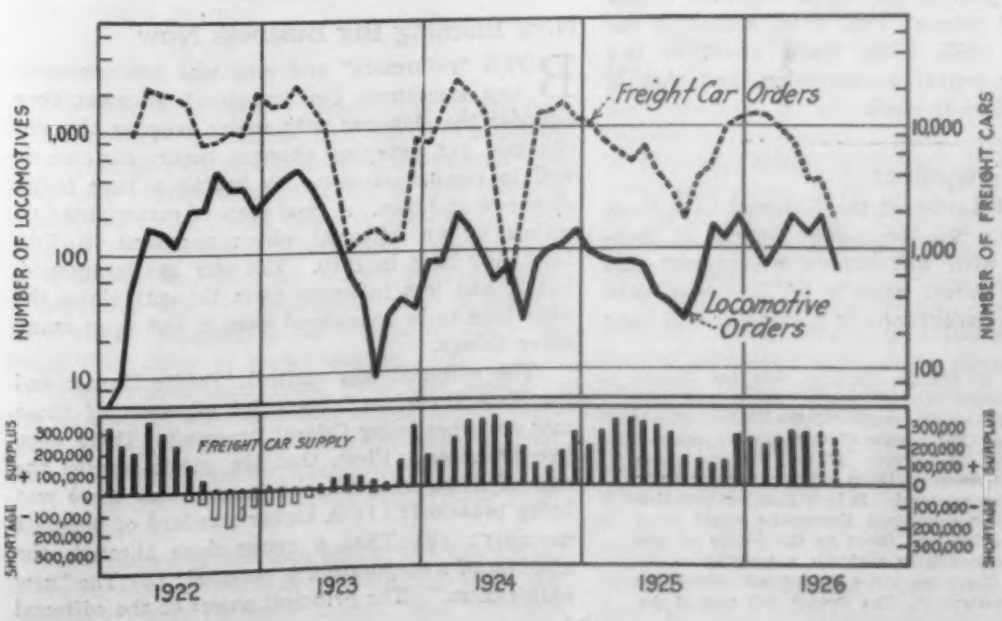

Fig. 3 — Locomotive Orders in July Were Much Lower Than in June; Freight Car Business in July Was Also Low. Both curves are here plotted as a 3-month moving average

ESTABLISHED 1855

THE IRON AGE

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Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

C. S. BAUR, *General Advertising Manager*

F. J. Frank, *President*

George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. A. C. Pearson, *Chairman*. F. J. Frank, *Pres.* C. A. Musselman, *Vice-Pres.* Fred C. Stevens, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: 1362 Hanna Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Building. Buffalo: 833 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St.

Subscription Price. United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single Copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

PRINTED IN U. S. A.

New Twelve-Month Record in Steel

MORE steel was produced in the United States in the twelve months ended July 31 than in any previous twelve consecutive months. The total, 46,584,787 gross tons of ingots, compares with 44,140,738 tons in the (record) calendar year 1925 and with 46,018,204 tons in the twelve months ended June 30, 1926. Open-hearth steel was 84.4 per cent of the total, compared with 83.8 per cent in the calendar year 1925, showing a continuance of the steady displacement of Bessemer steel. Despite the downward trend of total steel production since the peak in March, new long-time records are being made because the summer figures for 1926 are higher than those of a year ago.

In our review of the first six months of the year in THE IRON AGE of July 1 we said: "Barring an untoward development affecting all business, what was considered highly improbable at the beginning of the year is no longer so regarded, and that is a total steel output for 1926 in excess of the remarkable showing for 1925 and establishing a new record for a calendar year." With the expectation that August production will equal that of July, it can now be said that only a falling off in the last four months of the year to an extent regarded highly improbable will prevent 1926 from exceeding the high record of 1925. Thus there would be two record-breaking years in succession, and that is quite the exception in steel.

Two Debt Viewpoints

IN the August Letter of the National City Bank of New York, Vice-President George E. Roberts comments with well known discernment and aptness on the latest aspects of European debt relations. Two paragraphs in particular will bear reprinting:

> The people of Europe consider that the United States had the same interest in the war as they, and a great majority of the people of the United States do not think so. The people of this country are not unlike the people of Europe. If they did not come from Europe themselves, their parents did, or their ancestors not far removed. It is altogether probable that under similar conditions Europeans would react to the war situation just about as the people of this country did. Indeed it is easy for a traveler to observe that the European allies do not see everything from the same viewpoint. The French feel that if the British properly appreciated the sacrifices which France made for the common cause they would say nothing about debts and return the pledged gold to the Bank of France, while the British cannot help feeling that they are entitled to some gratitude for having crossed the Channel to get into a war which grew out of Continental complications and which they might have kept out of. If they had been 100 miles from the Continent instead of 30, more of them would have thought so, and if they had been as far away as the people of the Mississippi Valley they probably would have had about the same views as the latter.
>
> * * *
>
> It is a curious circumstance that all the European allies are agreed upon one proposition, viz.: that it would be absolutely fair to have all the war debts mutually canceled, and that they appear to be innocently incapable of understanding why the United States, the only country which is a creditor and not a debtor, does not see it in the same light.

M. Clemenceau and the large number of his countrymen who are applauding his inept letter to President Coolidge seem also incapable of understanding that their American ally of 1917-18 cannot think of taxing the people of the United States that France may continue her enormous military outlays and her unregulated administrative budgets. Strange that it does not occur to them also that a hymn of hate is a very poor prelude to fresh negotiations for American loans.

Now Blaming Big Business Now

BOTH "reformers" and men who are conservative sometimes feel impatient at what they consider the slowness with which popular thought changes, yet sweeping changes occur, and we do well to remind ourselves by taking a long range view now and then. A good piece of material is furnished by an editorial which appeared in THE IRON AGE back in 1910. The war has intervened, but it had less influence upon thought along the lines here to be considered than it had upon many other things.

The editorial was entitled "Public Unrest and the New Doctrines," the chief exponent of those new doctrines being Colonel Roosevelt. There were two premises: First, that the public wanted the cost of living reduced, and second, that there was being preached: (1) A higher standard of business morality; (2) That a crime done through the medium of a corporation is personal; (3) The "new nationalism." The principal object of the editorial

was to point out the danger of the public connecting these two premises and assuming that establishment of the three points in the second premise would meet the first, and reduce the cost of living. Now we see things so changed that there is no disposition in public thought to attempt to make that connection.

The complaint in 1910 about the high cost of living was due chiefly to what appeared to be the high cost of food. That was justified by the facts then existing. With the 1890-99 average as 100, farm products in 1910 averaged 164.6 and all commodities 131.6, so that farm products appeared to be 25 per cent above the general average. Last year's relationship was almost the same as that of 1910, but there was no complaint about it on that line, the complaint instead being that the farmers were not making enough money. By the new system of relatives, with 1913 as 100, farm products in 1910 were 103 and all commodities 101, while in 1925 farm products were 157.8 and all commodities 158.5.

Complaint about the high cost of living has largely passed and the danger of the living cost being blamed on "big business" has passed completely. Even more: Big business is recognized as the means of reducing the cost of living, and it was big business that was under scrutiny, if not under fire, sixteen years ago.

Improvement along two lines in particular is needed now for the public benefit—a betterment in the farmer's position, and more efficiency in the building of homes, leading either to better homes or larger homes for the same money, or cheaper homes.

Instead of public thought blaming big business for troubles as in 1910, public thought today would run along the line that if the efficiency of such large units as the Ford Motor Co., the United States Steel Corporation or the General Electric Co. were applied to farming there would be more profit in farming or the selling prices of farm products would be lower, and if applied to the building of dwelling houses there would be better or larger houses or cheaper houses. Public thought has responded to the information it has acquired in these sixteen years.

Capital and Credit

IT is often to be read in financial papers and even in economic quarterlies that capital is abundant or scarce; or that capital is being withdrawn from stocks for reinvestment in bonds; or that owing to liquidation of securities there is idle capital available for use when good opportunity presents itself. It is unnecessary to refer to such remarks quotationally, for they are so common as to be generic. In a recent economic paper Professor Cassel exposed the fallacy of such thoughts.

It is obvious that capital is neither locked up nor released by transactions in securities; for every seller must have a buyer, and every buyer a seller. Such transactions cannot, therefore, mean anything more than change of ownership, and perhaps shiftings of credits.

"Speculation in fact does not require any capital in the sense of encroaching on the supply of capital elsewhere," says Professor Cassel, "and therefore does not deprive productive work of any capital which would otherwise have been at its disposal."

This will be clear if it be considered that an inventory of the wealth and capital (two different things) comprises only physical things. Both flow out of savings, and savings out of work. As soon as savings accumulate they are drawn into buildings or other forms of wealth and capital through the payment of wages and the purchase of material, and thus are locked up. This wealth or capital is consumed only by amortization, i. e., as it wears out.

"All capital is therefore continuously in use. A transfer of the capital thus tied up from one use to another is not possible. It is possible, on the other hand, for individuals to exchange investments of capital. But in such exchanges the amount of capital which flows into a particular field of activity must be counter-balanced by a corresponding outflow." Thus concludes Professor Cassel.

To the sound-thinking economist this is elementary, by which we mean fundamental. We are bound, however, to offer certain qualifications, which no doubt were unmentioned by the distinguished Swedish economist owing to his very terseness. Capital may be consumed more quickly than by amortization when the labor and material for its production are misdirected. It follows, therefore, that an industrious and saving people may not steadily become richer. Labor and material may also be used for the production of gems and paintings, monuments and parks, which are wealth rather than capital.

This really reveals what underlies the popular fallacy in respect to plethora or dearth of capital. What the financial writer means is not capital but credit. If the capital goods previously created are productively in use, credit will be easy. If not so, credit will be contracted. There is, therefore, a connection between the prices of securities and credit. Speculation does not, to be sure, encroach on capital, but it is closely associated with credit, and upon credit depends largely the creation of new capital goods. For when credit fails there is unemployment of labor and shortening of savings.

Do Shop Schools Pay?

EDUCATION of young men in American industry at the expense of employers has been carried on long enough to give a good general idea of results. Many establishments now maintain training classes. The large majority are conducted as an optional auxiliary outside of shop hours and have proved of benefit to great numbers of employees, chiefly young men.

Various companies, usually in specialized industries, where customers have their own particular problems and where competition is on technical lines, are conducting schools of a far more ambitious character. The courses cover several years. Students are paid a living wage, though what they produce is negligible and wholly incidental to their training. The curriculum is usually an intensive one, but is not too strictly technical, for subjects such as English come in for attention. The annual cost to the firm reaches a substantial figure. For this reason

some industrialists have looked upon the practice with skepticism, believing that the same results would be obtained, at no cost at all, if the young men were absorbed into the organization in the usual way. Experience seems to have demonstrated that the critics were wrong. Owners who have tried the plan, though without exact data upon which to base a money estimate, are convinced that the outlay for schools is a good investment, already showing some returns and promising real profits as the years go by.

A school of this type has been carried on for a number of years in a large works, the products of which are constantly finding new uses and being expanded to meet customers' requirements. A three years' course with pay is offered to graduates of high schools, trade schools and engineering schools. The entire working day is devoted to class room, drafting room, laboratory and to studies of the various production departments and the sales department. The students are given more than a taste of the practical side of manufacturing and of running the business.

The young men are sifted out automatically, according to ability, bent and ambition. Upon graduation one finds his way into the shop, another into sales, a third perhaps into safety engineering, another into research, and so on. The main aim of the school is to train men for shop executive positions, beginning as sub-foremen, and for the sales department. Probably sales training is considered the more important. The school is held to be the best possible road by which to enter sales from the shop.

The salesman of the "drummer" type no longer suffices in industry. The man on the road must accomplish more than to make a round of his trade, fighting for new customers and holding on to old. He must be a resourceful business missionary, knowing his product and its possibilities down to the raw material of its manufacture. He must be a teacher while establishing his product in a customer's plant. He must be a doctor if complaint comes up. He must know the home works so well that when difficulties confront him which he cannot overcome he knows just where to go for expert assistance. He is a valuable asset. A school which provides young men with the fundamentals upon which to build sales careers should pay high dividends.

CORRESPONDENCE

Unscrupulous Practice in Selling Scrap

To the Editor: I wish to call your attention to the fact that some dealers and some brokers are practising deception and causing losses unjustly.

For instance, they will buy shoveling or heavy melting steel made from country steel, which is not equivalent to heavy railroad steel, sell it for heavy railroad steel at heavy railroad steel price, buying for what it originally was at reduced prices, and if it is rejected make the shipper suffer and stand an undue loss. I have been through that experience.

Such brokers and dealers should come under the searchlight and be exposed. I am willing to contribute toward a fund to inform the trade on this subject and to expose unscrupulous dealers and brokers. I will thank you to give this matter a little ventilation in your valued paper. BEN S. BARNARD.

DANVILLE, ILL., Aug. 6.

Walworth Company Realines Foundry Production

July shipments by the Walworth Co. exceeded those for June by about 15 per cent, while those for the first six months of the year were about 18 per cent larger than those for the corresponding period in 1925. The company is passing through a readjustment in its production schedules. Castings will be made in plants where lowest costs are obtainable, regardless of where they were made heretofore. For instance, it has been found that gray iron and malleable iron castings can be made cheaper in plants other than Boston, and production of such castings in Boston will be materially decreased. On the other hand, brass castings can be made as cheaply in Boston as elsewhere.

A line of buses to transport its employees between Bristol and Collinsville, Conn., will be operated by the New Departure Mfg. Co., Bristol, Conn. Heretofore the company leased the buses.

Coke Rates from Virginia and Birmingham to California Upheld

WASHINGTON, Aug. 10.—Rates on coke in carloads from Appalachia, Stonega and other producing points in Virginia and from Birmingham to destinations in California, are not unreasonable or unduly prejudicial, according to a decision made public last week by the Interstate Commerce Commission in passing upon a complaint filed by the Romann & Bush Pig Iron & Coke Co. In the same opinion the commission held that rates on coke in carloads from Chattanooga, Tenn., to destinations in California, were not unreasonable but resulted in undue prejudice to the extent that they exceeded the rates from the Birmingham district to the same destinations. A previous order removing this undue prejudice has been complied with.

At the time of the hearing the rate from Chattanooga was $13.60 and from Birmingham, $12. From points in Virginia on the Interstate Railroad the rate to Chattanooga was $2.25 and to Birmingham $3.04, making total through rates to California $15.85 and $15.04.

Timken Co. to Take Over Bock Bearing Co.

Negotiations are under way for the purchase of the plant and business of the Bock Bearing Co., Toledo, by the Timken Roller Bearing Co., Canton, Ohio. The Toledo plant was built originally for W. E. Bock for the manufacture of a roller bearing. Later it became a part of the Standard Parts Co., Cleveland, but when that organization was dissolved, it was taken over by Cleveland interests and operation continued. R. E. Clingas is the active manager of the company. A special meeting of the stockholders of the Bock company has been called for Aug. 16 to take final action on the negotiations.

A committee on management research methods and qualifications has been organized by the board of directors of the American Management Association. The purpose is to stimulate an interest in and growth of scientific method in management investigations, and to afford some means of encouragement through professional recognition for those who are competent users of scientific methods of investigation in the management field.

FABRICATED STRUCTURAL STEEL

Awards About 20,000 Tons—Two New York-New Jersey Bridges to Take 32,000 Tons

August bookings of fabricated structural steel will probably be swelled by the placing of two New York-New Jersey highway bridges requiring a total of 32,000 tons. Bids close Aug. 20 and awards will follow shortly thereafter. The week's awards of structural steel work were 20,000 tons. Details follow:

NEW YORK, 306 tons in the following awards reported to the Structural Steel Board of Trade: Kenetron Building, Hell Gate power station, and addition to Postal Telegraph Building, to Post & McCord.

NEW YORK, 2500 tons, 20-story apartment building, 1 Fifth Avenue, to Hedden Iron Construction Co.

NEW YORK, 1500 tons, 14-story apartment building, Park Avenue and Seventy-eighth Street, to A. E. Norton, Inc.

NEW YORK, 1700 tons, Yeshiva College, Amsterdam Avenue and 186th Street, to Levering & Garrigues Co.

NEW YORK, 1000 tons, office building, 58 Broad Street, to Levering & Garrigues Co.

BROOKLYN, 110 tons, Home for Aged, 1680 Sixtieth Street, to North American Iron Works.

BROOKLYN, 540 tons, theater, Kenmore Place, to Hinkle Steel Construction Co.

INWOOD, L. I., 100 tons, public school No. 2, to August Bellon, Inc.

RIDGEWOOD, L. I., 465 tons, theater, to Hinkle Steel Construction Co.

WHITE PLAINS, N. Y., 400 tons, garage, to McClintic-Marshall Co.

NEW HAVEN, CONN., 600 tons, building for Southern New England Telephone Co., to Levering & Garrigues Co.

VERMONT, 500 tons, State highway bridge, to an unnamed fabricator.

PHILADELPHIA, 1250 tons, auditorium for University of Pennsylvania, to an unnamed fabricator.

WILKES-BARRE, PA., 300 tons, highway bridge, to Phoenix Bridge Co.

WILLIAMSPORT, PA., 300 tons, car barn, to a local fabricator.

WASHINGTON, 2435 tons, Inland Waterways Corporation (Federal barge line), 15 barges for Upper Mississippi River barge line, to Midland Barge Co., Midland, Pa.

CHATTANOOGA, TENN., 300 tons, railroad shop building, to Convers Bridge Co.

CINCINNATI, 180 tons, Red Bank grade crossing, to Massillon Bridge & Iron Co.

LOUISVILLE & NASHVILLE RAILROAD, 225 tons, bridge, to McClintic-Marshall Co.

INDIANAPOLIS, 850 tons, Indiana theater, to Hetherington & Berner, Indianapolis.

DETROIT, 200 tons, Wabash freight house, to McClintic-Marshall Co.

CEDAR RAPIDS, IOWA, 900 tons, columns for Quaker Oats Co. Building, to unnamed fabricator.

KOHLER, WIS., 200 tons, building for Kohler Co., to Worden-Allen Co.

MILWAUKEE, 350 tons, East Side theater, Farwell and North Avenues, to Lakeside Bridge & Steel Co.

MILWAUKEE, 140 tons, addition for Layton Packing Co., to Lakeside Bridge & Steel Co.

JANESVILLE, WIS., 650 tons, extension of Chevrolet-Fisher body factories, to Lakeside Bridge & Steel Co.

GUERNSEY, WYO., 375 tons, penstock and surge tank, for the United States Bureau of Reclamation, to Mead-Penn Iron Works, Meadville, Pa.

SAN FRANCISCO, 300 tons, apartment building at 1958 Vallejo Street, to Central Iron Works, San Francisco.

CLARK'S FORGE, WASH., 660 tons, bridge in Bonner County near Clark's Forge, to unnamed fabricator.

TACOMA, WASH., 250 tons, Masonic Temple, to Starr Iron Works, Tacoma.

SEATTLE, WASH., 200 tons, Mines Building, University of Washington, to unnamed company.

WENATCHEE, WASH., 100 tons, filtration plant, to unnamed fabricator.

BEND, ORE., 375 tons, two steel reservoirs, to Chicago Bridge & Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON, 800 tons, power house; Stone & Webster general contractors.

BOSTON, 700 tons of beams and 135 tons of plates for the Transit Commission, Bethlehem Steel Co. low bidder.

WORCESTER, MASS., 3000 tons, transmission towers, New England Power Co.

WEST WARREN, MASS., 200 tons, two bridges, Boston & Albany Railroad.

PORTSMOUTH, N. H., 111 tons, Atlantic Gypsum Products Co. plant.

NEW YORK, 32,000 tons, superstructures of two bridges for the Port of New York to span the Kill van Kull from Staten Island to New Jersey, one running from Holland Hook, S. I., to Elizabethtown, N. J., requiring 19,000 tons, and the other from Tottenville, S. I., to Perth Amboy, N. J., requiring 13,000 tons. Bids close Aug. 20.

NEW YORK, 500 tons, city pier on the East River.

ASBURY PARK, N. J., 450 tons, power house; Dwight P. Robinson & Co., general contractors.

PHILADELPHIA, 500 tons, insuramve building on Market Street.

PHILADELPHIA, 1500 tons, Huntington Park apartments on Walnut Street.

DAYTON, OHIO, 200 tons, Lincoln School.

COLUMBUS, OHIO, tonnage unknown, Woman's Building; Richards, McCarty & Bulford, Columbus, architects.

OXFORD, OHIO, 125 tons, building for Miami University.

FREEPORT, ILL., 300 tons.

MILWAUKEE, 300 tons, Masonic Temple.

MILWAUKEE, Hotel Schroeder, 2000 to 2500 tons; plans in process by Holabird & Roche, architects, Chicago; bids about Sept. 10.

SEATTLE, WASH., 500 tons, two small steamers for unnamed firm.

RAILROAD EQUIPMENT

New York Central Inquires for Passenger Equipment—Business in Cars Almost at Standstill

Business in railroad equipment is almost at a standstill, inquiries and orders being few and for small lots. The principal inquiry of the week is for 124 items of passenger equipment for the New York Central Lines.

Railroad locomotives shipped in July totaled 132, as compared with 159 in June, according to the Department of Commerce.

Details of current equipment business follow:

The New York Central has issued an inquiry for 124 passenger, baggage and milk cars divided as follows: 40 passenger coaches, 30 suburban coaches, 20 baggage cars, 5 baggage-mail cars, 4 passenger-baggage cars and 20 milk cars.

The Public Service Co. of Northern Illinois has ordered 3 hopper cars from the American Car & Foundry Co.

The Richmond, Fredericksburg & Potomac has bought 1 dining car from the Pullman Car & Mfg. Corporation.

The Cambria & Indiana has let contract to the Greenville Steel Car Co. for the repair of 250 hopper cars.

The Pere Marquette is inquiring for 25 all-steel hopper cars.

The Atchison, Topeka & Santa Fe has ordered 40 locomotive tenders from the Baldwin Locomotive Works.

The Chesapeake & Ohio has contracted for the repair of 25 Mallet-type locomotives. The work was divided among the American Locomotive Co., Newport News Shipbuilding & Drydock Co. and the Erie Railroad, Hornell, N. Y. shops.

The St. Louis Car Co. is low bidder on 10 street cars for the Seattle Municipal Street Railway, Seattle, Wash. Its bid was $17,500 each, the total bid being $1,400,000. The J. G. Brill Co. bid $19,969 each, or a total of $1,597,520.

Galvanized Sheets Used for Buildings in Sumatra

WASHINGTON, Aug. 9.—Galvanized corrugated sheets are in active demand in northern Sumatra and imports of this product have increased substantially during the past 18 months, according to a report received by the Department of Commerce from Consul Sydney B. Redecker, Medan, Sumatra. The imports of galvanized sheets into northern Sumatra last year were considerably greater than in any previous year, amounting to 3628 tons, an increase of about 60 per cent over the previous high record of the abnormal year, 1920.

Consul Redecker states that galvanized corrugated sheets are used extensively by both Europeans and natives for walls, roofs and partitions of all kinds. Northern Sumatra has a total population of approximately 3,000,000; of this number about 12,000 are Europeans, and several hundred thousand Chinese and other foreign Orientals.

Iron and Steel Markets

August Continues July Betterment

Ingot Output Now Above Last Month's Average—Increased Demand for Sheets—Promise of Record Year in Steel —Heavy Melting Scrap Active and Higher

IN so far as the first third of the month is a gage, August promises to equal July in steel output and in volume of specifications and new business. Indications accumulate of a continuance of the present scale of activity into the fall, and the opinion is growing among producers and consumers that 1926 will exceed 1925 as a steel year.

Steel ingot figures for July, showing output of 140,425 tons a day, which was a 78 per cent operation, against 80 per cent in June, bore out predictions that June and July would be close together after a succession of 4 per cent steps—from 92 in March to 88 in April, 84 in May and 80 in June.

The remarkable performance of last month brought steel ingot production in the 12 months ended July 31 to the new high total of 46,584,787 tons. This exceeds the best previous 12-month performance—that for the year ended June 30—by more than 500,000 tons.

Favorable also was the Steel Corporation gain of 123,880 tons in unfilled orders last month, following six months of successive losses. In double contrast, there was a falling off of 171,000 tons in July last year which was only a 65 per cent month in operations as against 78 per cent last month.

As a triple measure of the unexpected betterment that has come to the Western market this year, Chicago steel producers estimate that new sales, specifications and shipments of finished steel products from mills in that district in the seven months ended with July all averaged about 12 per cent above those for the corresponding period in 1925.

Steel Corporation ingot production thus far in August has been close to 88 per cent. In the Pittsburgh and near-by districts independent and corporation plants have averaged 80 per cent, though in sheets and tin plate hot weather has made some reduction.

Buying of sheets shows a substantial gain, some important producers having the largest week's business of the year with one exception. Reports of firmer prices seem to have better ground, and several sellers are declining galvanized sheet business at less than 4.30c. If the mooted change in base and in gage differentials on black sheets is adopted it will mean higher prices for the lighter gages.

Pipe business of the week included some 5000 tons of 8 and 10-in. line pipe for a subsidiary of a large oil company.

Two New York-New Jersey bridges to be let this month will take 32,000 tons of steel. Transmission towers in New England call for 3000 tons, a Milwaukee hotel will require 2500 tons and a New York apartment building, just awarded, 2500 tons. The Lake Pontchartrain bridge at New Orleans will have 9500 tons of concrete reinforcing bars.

After several weeks in which dealer buying and selling of heavy melting steel scrap have been mostly in evidence, consumer activity has been a factor this week. With sales of 40,000 to 50,000 tons in the East, the market is 50c. a ton higher on this grade, and from 50c. to $1.50 a ton up on other grades. Moderate-sized buying at Pittsburgh has also advanced steel scrap there 50c. The New York, Buffalo and Cincinnati markets are stronger and more active. The present range on steel scrap at Pittsburgh, $17.50 to $18, is within $1.50 of the high of the year.

Apart from sales of 16,000 tons of basic at Philadelphia, the pig iron market has been quiet. An interesting development in imports is an advance of 75c. in German iron, following one of 25c. two weeks ago. Less German iron in the Eastern market is the probable result. On the other hand, the Treasury Department has held up indefinitely the expected countervailing duty on Indian iron.

British makers of ferromanganese on Aug. 7 reduced their price to $100, Baltimore. Domestic users generally covered for most if not all of 1926 in the three-cornered competition that between December and April brought the price down from $115 to $88. As British sellers have been considered out of the race this year and $100 is well above the domestic market, the reason for this week's announcement does not yet appear.

Imports of foreign steel products on the Pacific coast are growing. At the same time sellers are using lower prices to get a foothold against domestic steel. Belgian reinforcing bars were quoted last week at 1.60c., duty paid, and foreign shapes at 1.75c. to 1.80c.

Meanwhile rates on water shipments of steel from domestic Atlantic ports to the Pacific Coast have been dropped $1 a ton to 25c. per 100 lb. San Francisco importers received in the week from Germany 7000 tons of coke.

British steel production, with the help of foreign fuel is increasing. Makers are well sold and premiums of $2.50 to $6 a ton are asked for shipments within three months.

Germany, through Otto Wolff & Co., has secured a $5,000,000 tube order from the Russian oil trade on credits extending 4½ years.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 10, 1926	Aug. 3, 1926	July 13, 1926	Aug. 11, 1925
No. 2, Philadelphia‡	$21.76	$21.76	$21.76	$21.01
No. 2, Valley Furnace†	17.50	17.50	17.75	18.50
No. 2, Southern, Cin'ti†	24.19	24.19	24.19	22.55
No. 2, Birmingham†	21.00	21.00	21.00	18.00
No. 2 foundry, Chicago*	21.00	21.00	21.00	20.50
Basic, del'd, eastern Pa.	21.00	21.00	21.00	20.50
Basic, Valley furnace	17.50	17.50	17.50	18.00
Valley Bessemer del. P'gh	19.76	19.76	20.26	20.76
Malleable, Chicago*	21.00	21.00	21.00	20.50
Malleable, Valley	17.50	17.50	17.75	18.50
Gray forge, Pittsburgh	18.76	18.76	19.01	19.76
L. S. charcoal, Chicago	29.04	29.04	29.04	29.04
Ferromanganese, furnace	88.00	88.00	88.00	115.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	34.00	34.00	34.00	35.84
Bess. billets, Pittsburgh	35.00	35.00	35.00	35.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	35.00
O.-h. sheet bars, P'gh	36.00	36.00	36.00	35.00
Forging billets, base, P'gh	40.00	40.00	40.00	40.00
O.-h. billets, Phila	40.30	40.30	40.30	40.30
Wire rods, Pittsburgh	45.00	45.00	45.00	45.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.90	1.90	1.90	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.22	2.22	2.22	2.17
Iron bars, Chicago	2.00	2.00	2.00	1.90
Steel bars, Pittsburgh	2.00	2.00	2.00	2.00
Steel bars, Chicago	2.10	2.10	2.10	2.10
Steel bars, New York	2.34	2.34	2.34	2.34
Tank plates, Pittsburgh	1.90	1.90	1.90	1.90
Tank plates, Chicago	2.10	2.10	2.10	2.10
Tank plates, New York	2.24	2.24	2.24	2.14
Beams, Pittsburgh	2.00	2.00	2.00	2.00
Beams, Chicago	2.10	2.10	2.10	2.10
Beams, New York	2.34	2.34	2.34	2.24
Steel hoops, Pittsburgh	2.50	2.50	2.50	2.40

Sheets, Nails and Wire,	Aug. 10, 1926	Aug. 3, 1926	July 13, 1926	Aug. 11, 1925
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.10	3.10	3.10	3.15
Sheets, black, No. 28, Chicago dist. mill	3.25	3.25	3.25	3.30
Sheets, galv., No. 28, P'gh	4.20	4.20	4.25	4.20
Sheets, galv. No. 28, Chicago dist. mill	4.40	4.40	4.40	4.35
Sheets, blue, 9 & 10, P'gh	2.30	2.30	2.30	2.30
Sheets, blue, 9 & 10, Chicago dist. mill	2.40	2.40	2.40	2.40
Wire nails, Pittsburgh	2.65	2.65	2.65	2.65
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.70
Plain wire, Pittsburgh	2.50	2.50	2.50	2.50
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.55
Barbed wire, galv., P'gh	3.35	3.35	3.35	3.35
Barbed wire, galv., Chicago dist. mill	3.40	3.40	3.40	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$16.00	$16.00	$16.50	$17.50
Carwheels, Philadelphia	17.50	17.00	17.00	18.50
Heavy steel scrap, P'gh	17.50	17.00	17.00	19.00
Heavy steel scrap, Phila	16.00	15.75	15.00	16.50
Heavy steel scrap, Ch'go	14.00	14.00	14.25	16.25
No. 1 cast, Pittsburgh	16.50	16.50	16.50	17.50
No. 1 cast, Philadelphia	17.50	17.00	17.00	18.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	17.25	17.50
No. 1 RR. wrot, Phila	18.00	16.50	16.50	17.50
No. 1 RR. wrot. Ch'go (net)	13.50	13.50	13.25	16.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.85	$2.85	$2.75	$2.90
Foundry coke, prompt	4.00	4.00	4.00	3.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.62½	14.50	14.12½	14.87½
Electrolytic copper, refinery	14.25	14.25	13.87½	14.62½
Zinc, St. Louis	7.30	7.40	7.52½	7.57½
Zinc, New York	7.65	7.75	7.87½	7.92½
Lead, St. Louis	8.75	8.90	8.20	9.50
Lead, New York	9.00	9.15	8.40	9.50
Tin (Straits), New York	66.00	65.00	62.62½	58.62½
Antimony (Asiatic), N. Y.	17.00	16.00	14.00	18.12½

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Mills Take Stronger Stand on Sheet Prices—Scrap Advances

PITTSBURGH, Aug. 10.—Steel business is holding its own in volume with that of the past few weeks, but only in sheets does there seem to be any actual gain and this probably is due to the fact that makers are taking a stronger stand on prices. Several of the larger producers now are refusing galvanized sheet business at less than 4.30c., base Pittsburgh, and the report is persistent that higher prices for automobile body sheets are not far off, while a change in the base and gage differentials on black sheets, if adopted, will mean materially higher prices for the lighter gages. Buyers seem impressed by these developments and are disposed to buy somewhat further ahead than recently. In a general way, there has been no departure from close range buying, with real requirements the gage of purchases. This has been the policy of buyers for some time, and they entered the last half of the year with stocks small in relation to consumption, which usually is good at this time of year and especially so this year because of the delays set up by the backwardness of the spring and summer.

This and nearby districts had a substantial increase in ingot production during July, going from an average of around 70 per cent to above 80 per cent, and the higher rate still is being maintained. It is doubtful, however, if actual production is quite up to the percentage of plant engagement, because hot weather has appreciably affected the efficiency of the workmen. The weather probably contributed to last month's loss of ingot output for the country as a whole, as compared with June, but the rate of production still is surprisingly high for the time of year. The rapid increase in operations in this section is explained by the fact that steel makers had expected quiet times for July and August and, having allowed stocks to run down, had to quickly bring up their operations in order to take care of the demand and take care of it promptly. It now looks as if production and demand again were in balance.

The last dip in pig iron prices appears to have brought the market to a level where producers are more disposed to cut production than take the loss that the present figures entail. Higher prices are wanted by several makers, but establishing them is difficult, because so many consumers covered as the market declined. A strong market in scrap, with the steel works grades 50c. higher than a week ago also is offered as basis for a stronger pig iron market. Not much change is observed in the fuel market so far as spot supplies are concerned, but two good-sized inquiries for furnace coke for shipment over the remainder of the year have disclosed that producers want higher prices on future shipments than on spot tonnages.

Pig Iron.—The market generally is lacking in life, because so few consumers seem to have passed up the opportunity of buying as prices sagged during the past three months, and those who now need iron are the small-lot users who rarely buy much ahead of their

actual requirements. Producers have taken a firmer price stand, but it is difficult to set up an advance when the demand is so limited as at present. Some producers have steadfastly refrained from going below $18, Valley furnace, for No. 2 foundry, $17.50 for basic and $19 for Bessemer, but on competitive business foundry iron went to $17.50 for the base grade and Bessemer to $18, and these prices have been reached too recently for consumers to have forgotten them. Sales of Bessemer iron, one of 500 tons, are noted at $19, Valley Furnace, but there are still open quotations of 50c. or $1 a ton less. The only test the market recently has had was in two inquiries for foundry iron, one of 6000 tons and the other of 2000 tons. These inquiries originated in the Buffalo district, and at least one of them has been placed with Buffalo producers at a delivery price which is less than on Valley iron carrying a freight rate of $2.65 per ton.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$17.50 to $18.00
Bessemer	18.00 to 19.00
Gray forge	17.00 to 17.50
No. 2 foundry	17.50 to 18.00
No. 3 foundry	17.00 to 17.50
Malleable	17.50 to 18.50
Low phosphorus, copper free	27.50

Ferroalloys.—New business amounts to little, but this is because consumers are covered against their requirements of ferromanganese, spiegeleisen and high grade ferrosilicon for the remainder of the year. Specifications are being made steadily, since the sustained rate of steel works operations makes for steady consumption. No domestic 19 to 21 per cent spiegeleisen is offered for shipment over the remainder of the year. Prices are given on page 447.

Semi-Finished Steel.—There has been some shading of the regular market price of forging quality billets, but this seems to have been by a mill which recently entered that field and, like all new producers, has found it necessary to "buy" its way in. The more common price still is $40, base Pittsburgh. In other directions the semi-finished steel market is uniformly steady at prices that have ruled since late last year, with real firmness showing in sheet bars. Usually, the price of sheets bars is governed by the prices of finished sheets, but a rather sharp decline in sheet prices since early in the year has not disturbed sheet bar prices, which have held very consistently at $36, Pittsburgh or Youngstown, or $36.50 delivered to Pittsburgh and Youngstown district points. Open market activity in the various forms of steel is reduced to a minimum by the fact that so many non-integrated mills now depend upon regular supply sources and work on a requirement contract basis. Specifications are heavier than in the second quarter of the year, because of the surprisingly good third quarter business in finished steel products. Prices are given on page 447.

Wire Products.—There is the same steady demand for plain wire and nails there has been throughout the summer. This is the season of good consumption, but jobbers, contrary to usual practice, have allowed the mills to carry the stocks. Plain wire still is the most active product. A good deal more tonnage than in former years is required for mesh concrete reinforcement, while other uses for wire do not seem to have fallen off much. Prices are steady. They are given on page 445.

Rails and Track Supplies.—Real activity is lacking in these lines. Railroads tributary to Pittsburgh are laying, but not buying, standard rails, and most of the tonnage placed late last year for this year's shipment has been rolled and delivered. Light rails are slow. Spikes and other accessories still are moving fairly steadily on old orders, but there is not much new demand. Prices are given on page 445.

Tubular Goods.—Demand for standard pipe is somewhat lighter, but the call for oil country goods shows all its recent strength and urgency. There is accordingly physically full engagement of lap-welded pipe capacity and this entirely on live orders. Butt-welded pipe furnaces are running well, but part of the production is going to the rebuilding of mill stocks, which were well reduced and much broken up by the spring and summer demands. In the lap-welded sizes all makers still are observing a policy of giving definite delivery promises only when shipping instructions come with the order making possible the scheduling of the order. There is still considerable line pipe on order, and a fair amount of new business is coming out steadily. It is doubtful now whether the big gas lines east and west from the Amarillo, Tex., field will be placed before next spring. General demand for boiler tubes is not strong enough to sustain higher prices, but there seems to be a fairly satisfactory situation in seamless steel tubes, and seamless pipe is gaining in favor and use in the oil fields. Discounts are given on page 445.

The Marland Refining Co. is in the market for 50 miles of 8-in. pipe for a line in Texas.

Bolts, Nuts and Rivets.—Demand for bolts and nuts is steady enough, but purchasers are not buying ahead of their actual needs. There is only a fair market for rivets and continued irregularity in the prices of large ones. Railroad car orders would help sales. Prices and discounts are given on page 447.

Sheets.—The expanding tendency in demand is finally beginning to have some effect upon prices. At least four large independent producers have taken a stand at 4.30c., base Pittsburgh, for galvanized sheets and are refusing business at less. With the American Sheet & Tin Plate Co. also at that price, considerable capacity is represented by the companies now quoting that figure. An advance in automobile body sheets is mentioned as an early possibility, and a revision of black sheet schedules, now in preparation, will result in substantially higher prices for the lighter gages, which, it is contended, have been selling too low in relation to the heavier sheets. In a general way, the effort to impress buyers with the fact that they have been getting sheets too cheaply is succeeding, and the latter are

THE IRON AGE Composite Prices

Finished Steel

Aug. 10, 1926, 2.431c. Per Lb.

One week ago	2.431c.
One month ago	2.431c.
One year ago	2.439c.
10-year pre-war average	1.689c.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	April 24;	2.446c.,	Jan. 2

Pig Iron

Aug. 10, 1926, $19.46 Per Gross Ton

One week ago	$19.46
One month ago	19.50
One year ago	19.00
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1926	$21.54,	Jan. 5;	$19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	2.00c. to 2.10c.
F.o.b. Chicago	2.10c.
Del'd Philadelphia	2.32c.
Del'd New York	2.34c.
Del'd Cleveland	2.19c.
F.o.b. Birmingham	2.15c. to 2.25c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	2.00c. to 2.10c.

Rail Steel

F.o.b. mill	1.80c. to 1.90c.
F.o.b. Chicago	2.00c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	3.00c.
Common iron, del'd Philadelphia	2.22c.
Common iron, del'd New York	2.24c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill	1.90c.
F.o.b. Chicago	2.10c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.09c.
Del'd Philadelphia	2.22c.
Del'd New York	2.24c.
C.i.f. Pacific ports	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mill	2.00c. to 2.10c.
F.o.b. Chicago	2.10c.
F.o.b. Birmingham	2.15c. to 2.25c.
Del'd Cleveland	2.19c.
Del'd Philadelphia	2.22c. to 2.32c.
Del'd New York	2.24c. to 2.34c.
C.i.f. Pacific ports	2.30c. to 2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	2.50c.
All gages, 6 in. and wider, P'gh	2.30c.
All gages, 6 in. and narrower, Chicago	2.60c.
All gages, wider than 6 in., Chicago	2.50c.
Cotton ties, f.o.b. Atlantic ports, per bundle of 45 lb	$1.22
Cotton ties, f.o.b. Gulf ports, per bundle of 45 lb.	1.20

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.50c.
Bars, f.o.b. Chicago	2.50c.
Bars, Cleveland	2.55c.
Shafting, ground, f.o.b. mill	*2.70c. to 3.00c.
Strips, f.o.b. Pittsburgh mills	3.60c.
Strips, f.o.b. Cleveland mills	3.40c. to 3.60c.
Strips, delivered Chicago	3.75c.
Strips, f.o.b. Worcester mills	3.75c.

*According to size.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.65
Galv'd nails, 1-in. and longer	4.65
Galv'd nails, shorter than 1 in.	4.90
Galvanized staples	3.35
Polished staples	3.10
Cement coated nails	2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.50
Annealed fence wire	2.65
Spring wire	3.50
Galv'd wire, No. 9	3.10
Barbed wire, galv'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	65.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.25c. to 2.30c.
Nos. 9 and 10, f.o.b. Ch'go dist. mill	2.40c.
Nos. 9 and 10, del'd Philadelphia	2.57c. to 2.62c.

Box Annealed, One Pass Cold Rolled

No. 28, f.o.b. Pittsburgh	3.05c. to 3.15c.
No. 28, f.o.b. Ch'go dist. mill	3.25c.
No. 28, del'd Philadelphia	3.32c. to 3.42c.

Galvanized

No. 28, f.o.b. Pittsburgh	4.20c. to 4.30c.
No. 28, f.o.b. Chicago dist. mill	4.40c.
No. 28, del'd Philadelphia	4.52c. to 4.62c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.10c. to 3.15c.
No. 28, f.o.b. Chicago dist. mill	3.25c.

Automobile Body Sheets

No. 28, f.o.b. Pittsburgh	4.20c.

Long Ternes

No. 28, 8-lb. coating, f.o.b. mill	4.75c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.40
8-lb. coating I.C.	11.70
15-lb. coating I.C.	14.85
20-lb. coating I.C.	$16.20
25-lb. coating I.C.	17.90
30-lb. coating I.C.	19.45
40-lb. coating I.C.	21.65

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(1½% Nickel, 0.10% to 0.20% Carbon)	$3.20 to $3.25
2300	(3½% Nickel)	4.40 to 4.50
2500	(5% Nickel)	5.50 to 5.65
3100	(Nickel Chromium)	3.40 to 3.50
3200	(Nickel Chromium)	5.00 to 5.25
3300	(Nickel Chromium)	7.00 to 7.25
3400	(Nickel Chromium)	6.25 to 6.50
5100	(Chromium Steel)	3.40 to 3.50
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.30
6100	(Chrom. Vanad. spring steel)	3.80
9250	(Silicon Manganese spring steel)	3.20 to 3.25
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.25 to 4.35
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.40 to 3.50
	Chromium Molybdenum spring steel (1 — 1.25 Chrom., 0.20 — 0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	$34.00 to 35.00
Light (from rail steel), f.o.b. mill	32.00 to 33.00
Light (from billets), f.o.b. Ch'go mill	36.00 to 38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ½ in. and larger	$2.90 to $3.00
Spikes, ⅜ in. and smaller	2.90 to 3.35
Spikes, boat and barge	3.25
Track bolts, all sizes	3.90 to 4.50
Tie plates, steel	2.25 to 2.35
Angle bars	2.75

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+30
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	25	11
¾	60	48½	1 to 1¼	30	12
1 to 3	62	50½			

Lap Weld

2	55	43½	2	28	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	7
½	53	42½	¾	28	12
¾	58	47½	1 to 1¼	30	14
1 to 1¼	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	46	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1⅝ to 1⅞ in.	+ 5
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3½ to 4½ in.	— 9

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3½ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	34	3½ and 3½ in.	50
2½ and 2¾ in.	42	4 in.	53
3 in.	45	4½, 5 and 6 in.	45

Less carloads, 4 points less. Add $5 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

showing a disposition to cover a little further ahead than they have been wont to recently. Jobbers are also heavier buyers and would buy for fourth quarter at present prices, but there are few, if any, producers willing to sell for delivery beyond Sept. 30. There was an operation of between 75 and 80 per cent of sheet mills last week, but production was adversely affected by the humidity. Prices are given on page 445.

Tin Plate.—There is still an active market in tin plate, as reflected in the fact that manufacturers find no trouble in disposing of stock items and odd sizes, and that those who dispose of the bulk of their production on contracts with regular consuming connections have been obliged to refuse business because they were unable to promise deliveries promptly enough. Mills that were running light on orders during June have filled up in the past 30 days, and there is a tight situation so far as early deliveries on production plate are concerned. Much foreign business might be taken if it could be shipped as quickly as it is wanted, and the price is at least $3 per ton higher than it was over the first half of the year. British producers, however, are getting imported coal and are operating somewhat better than they did during the early stages of the coal strike.

Cold-Finished Steel Bars and Shafting.—There continues to be a very steady demand for screw stock sizes of cold-finished bars, which constitute the heaviest part of the production of what was formerly called shafting. This is a reflection of the improved operations of the automotive industry. Prices are well held at 2.50c., base Pittsburgh, for ordinary tonnages.

Hot-Rolled Flats.—Forward buying is light, but current demands are steady enough to maintain a fairly high rate of mill operations and to prevent price weakness. Prices of hoops, bands and strips have shown unusual stability all year.

Cold-Rolled Strips.—Business is good, but there are too many buyers for sellers for prices to show real strength. The objective of all makers now is 3.60c., base Pittsburgh or Cleveland, on carload lots, but it is admitted that desirable orders are being lost at that price.

Warehouse Business.—Steel jobbers in this district report a good business for the time of year. Prices show no special change, but sheets are steadier.

Fluorspar.—Steel makers in this district are beginning to be interested in supplies of gravel spar for their winter requirements, but seem disposed toward foreign material on account of price. Imported gravel spar is offered at $17.50 to $17.75 per net ton, Atlantic seaboard, duty paid, and with a freight charge of $3.50, this means a delivered price of $21 to $21.25. Against that is a delivered price on domestic material of $23.25, or $18 at mines plus $5.25 per ton freight. Domestic producers stand to lose 10,000 tons of business in this area unless there is at least partial absorption of the difference in the prices. Consumers have indicated a willingness to pay more for domestic than foreign material, but balk at paying $2 a ton more. Domestic spar may have to come down to $17 at the mines, or $22.25, delivered Pittsburgh district points, to be sold in competition with imported material. The market still is quotable at $18, mines, to Western destinations from which foreign spar is barred by freight charges. Prices are given on page 447.

Steel and Iron Bars.—Specifications are coming along very steadily for steel bars, but strictly new business is moderate. There is no change in the price situation, with 2c., base, Pittsburgh, the ruling figure on current business in ordinary tonnages. Iron bars are not moving with much freedom.

Structural Steel.—There continues to be good specifying against steel on contract, but new business is confined largely to the small structural projects. On these, which still are fairly numerous, the fabricators are not disposed to haggle much over prices. The shops in this district are not getting much tonnage for late fall and winter shipment, although such business would be welcome, since present orders will be rather well worked out in the next 90 days. Plain material prices are given on page 445.

Plates.—The pleasing feature to producers is the firmness of prices rather than the size of the demand, which is no strain upon productive capacity. Steel for 15 barges, amounting to almost 2500 tons, will come to Pittsburgh mills, but mills in this part of the country do not benefit much from 20 55,000-bbl. oil tanks recently placed with a Youngstown district fabricator. Most of the tanks will be shipped from the Kansas City plant of the company. Prices are given on page 445.

Coke and Coal.—Spot offerings of beehive coke, though moderate, are quite sufficient for requirements, and prices are no stronger than they have been. But on future business, producers are disposed to take a stronger stand and two steel company inquiries, each for 15,000 tons a month over the remainder of the year, have brought out no lower quotations than $3.25 per net ton at ovens. Prices are given on page 447.

Old Material.—Dealers who have been behind the advance in steel works grades of scrap appear to have won out. One mill has paid $18 for a fair-sized tonnage of No. 1 railroad, or equivalent, heavy melting steel, and two others with less exacting specifications have paid $17.50, making the market clearly quotable at $17.50 to $18. This is an advance of 50c. a ton and brings the market to within $1.50 of the high price of the first of the year. There is still a good deal of consumer resistance to the advance, but offerings are very scant and those who must have supplies find they have to pay to get them. Heavy melting steel in the Pennsylvania Railroad August list is reported to have brought $18.15 per gross ton, delivered Pittsburgh. Other steel works grades have stiffened in sympathy with heavy melting grade and there is a stronger market in turnings and blast furnace material. With demand light, the market is yet to show much strength in the foundry grades. The Norfolk & Western Railway August list has 3411 gross tons.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Tank plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforced steel bars	2.90c.
Black sheets (No. 28 gage), 25 or more bundles	4.00c.
Galvanized sheets (No. 28 gage), 25 or more bundles	5.00c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.55c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Spikes, large	3.30c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Bolts, track	4.90c.
Wire, black soft annealed, base per 100 lb.	$3.00
Wire, galvanized soft, base per 100 lb.	3.00
Common wire nails, per keg	3.00
Cement coated nails	3.05

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton		
Heavy melting steel	$17.50 to	$18.00
No. 1 cast, cupola size	16.50 to	17.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	18.00 to	18.50
Compressed sheet steel		16.50
Bundled sheets, sides and ends		15.50
Railroad knuckles and couplers	18.50 to	19.00
Railroad coil and leaf springs	18.50 to	19.00
Low phosphorus blooms and billet ends	21.00 to	21.50
Low phosphorus mill plates	20.50 to	21.00
Low phosphorus, light grade	18.00 to	18.50
Low phosphorus punchings	18.50 to	19.00
Steel car axles	21.00 to	21.50
Cast iron wheels	16.50 to	17.00
Rolled steel wheels	18.50 to	19.00
Machine shop turnings	13.00 to	13.50
Short shoveling turnings	13.50 to	14.00
Sheet bar crops	18.00 to	19.00
Heavy steel axle turnings	15.50 to	16.00
Short mixed borings and turnings	13.00 to	13.50
Heavy breakable cast	16.00 to	16.50
Cast iron borings	13.00 to	13.50
No. 1 railroad wrought	13.50 to	14.00
No. 2 railroad wrought	17.50 to	18.00
Railroad or automobile malleable scrap	18.00 to	18.50

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F. o. b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rolling, 4-in. and over	$35.00
Rolling, 2-in. and smaller	36.00
Forging, ordinary	40.00
Forging, guaranteed	45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$36.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$35.00
6 in. x 2 in. and smaller	36.00

Skelp

	Per Lb.
Grooved	1.90c.
Sheared	1.90c.
Universal	1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$45.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $46. Cleveland mill base, $45.

Prices of Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 66% iron	9.50c.
Manganese ore, washed, 51% manganese, from the Caucasus	40c. to 42c.
Manganese ore, high grade, nominal	35c. to 44c.
Tungsten ore, high grade, per unit, in 60% concentrates	$11.75 to $12.50
	Per Ton
Chrome ore, Indian basic, 48% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.50
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton	
Furnace, f.o.b. Connellsville prompt	$2.85 to	$3.00
Foundry, f.o.b. Connellsville prompt	$4.00 to	4.50
Foundry, by-product, Ch'go ovens		9.75
Foundry, by-product, New England, del'd		12.00
Foundry, by-product, Newark or Jersey City, delivered	9.59 to	10.77
Foundry, Birmingham	5.50 to	6.00
Foundry, by-product, St. Louis or Granite City		10.00

Coal

	Per Net Ton	
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to	$1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to	1.75
Mine run gas coal, f.o.b. Pa. mines	1.85 to	2.00
Steam slack, f.o.b. W. Pa. mines	1.10 to	1.20
Gas slack, f.o.b. W. Pa. mines	1.20 to	1.30

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$88.00 to $95.00
Foreign, 80%, Atlantic or Gulf port, duty paid	88.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$32.00 to $34.00
Domestic, 16 to 19%	31.00 to 33.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00 to $87.50
75%	145.00 to 150.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$42.00	12%	$42.00
11%	42.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$33.00	12%	$37.00
11%	35.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$25.50	10%	$31.00
7%	26.50	11%	33.00
8%	27.50	12%	35.00
9%	29.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	$1.05 to $1.20
Ferrochromium, 4% carbon and up, 60 to 70% Cr., per lb. contained Cr. delivered	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.25 to $4.00
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid,	$17.50 to $17.75
Domestic, No. 1 ground bulk, 85 to 93% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	High Duty	Moderate Duty
Pennsylvania	$40.00 to $43.00	$38.00 to $40.00
Maryland	43.00 to 46.00	38.00 to 40.00
New Jersey	55.00 to 75.00	
Ohio	40.00 to 43.00	38.00 to 40.00
Kentucky	40.00 to 43.00	38.00 to 40.00
Illinois	40.00 to 43.00	35.00 to 38.00
Missouri	40.00 to 43.00	35.00 to 38.00
Ground fire clay, per ton	6.50 to	7.50

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00
Chicago	40.00
Birmingham	50.00
Silica clay, per ton	$8.00 to 9.00

Magnesite Brick

	Per Net Ton
Standard size, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.ob. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00 to $48.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

(Less-than-Carload Lots)

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

	Per Cent Off List
Machine bolts, small, rolled threads	60 and 10
Machine bolts, all sizes, cut threads	50, 10 and 10
Carriage bolts, smaller and shorter, rolled threads	50, 10 and 10
Carriage bolts, cut threads, all sizes	50 and 10
Eagle carriage bolts	65 and 10
Lag bolts	60, 10 and 10
Plow bolts, Nos. 3 and 7 heads	50 and 10
(Extra of 20% for other style heads)	
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.,	45, 10 and 5
Larger and longer sizes	45, 10 and 5
Bolt ends with hot-pressed nuts	50, 10 and 10
Bolt ends with cold-pressed nuts	45, 10 and 5
Hot-pressed nuts, blank and tapped, square,	4.00c. per lb. off list
Hot-pressed nuts, blank or tapped, hexagons,	4.40c. per lb. off list
C.p.c. and t. square or hex. nuts, blank or tapped	4.10c. per lb. off list
Washers*	6.50c. to 6.25c. per lb. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent more than above for car lots. On hot-pressed and cold-punched nuts the discount is 25c. more per 100 lb. than quoted above for car lots.

Bolts and Nuts

(Quoted with actual freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Semi-finished hexagon nuts:	
⅞ in. and smaller, U. S. S.	60, 10 and 5
⅞ in. and larger, U. S. S.	75, 10 and 5
Small sizes, S. A. E.	60, 10, 10 and 5
S. A. E., ⅝ in. and larger	75, 10, 10 and 5
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60 and 5

Semi-Finished Castellated and Slotted Nuts

(Actual freight allowed up to but not exceeding 50c. per 100 lb.)

(To jobbers and consumers in large quantities)

	Per 100 Net S.A.E.	Per 100 Net U.S.S.		Per 100 Net S.A.E.	Per 100 Net U.S.S.
½-in.	$0.44	$0.44	⅝-in.	$2.25	$2.40
⅝-in.	0.515	0.515	¾-in.	3.60	3.60
¾-in.	0.62	0.64	1-in.	5.65	5.80
⅞-in.	0.79	0.90	1⅛-in.	8.90	8.90
1-in.	1.01	1.05	1¼-in.	12.60	13.10
1⅛-in.	1.38	1.42	1⅜-in.	18.35	18.35
1¼-in.	1.70	1.73	1½-in.	21.00	21.00

Larger sizes.—Prices on application.

Large Rivets

	Base Per 100 Lb.
F.o.b. Pittsburgh	$2.50 to $2.60
F.o.b. Cleveland	2.70
F.o.b. Chicago	2.65 to 2.75

Small Rivets

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Milled cap screws	80 and 10
Milled standard set screws, case hardened,	80 and 5
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U. S. S. thread,	80, 10 and 10
Upset hex. cap screws, S.A.E. thread,	80, 10 and 10
Upset set screws	80, 10 and 5
Milled studs	70 and 5

Chicago

Record Sales of Bars in July—Gain in Middle West Building

CHICAGO, Aug. 10.—New sales, specifications and shipments of finished steel products in the Chicago territory for the first seven months of this year each show a gain of about 12 per cent as compared with the corresponding period of 1925. In plates and shapes, specifications for the week are approximately equal to shipments; in billet steel bars, specifications are heavier than shipments. At the same time, fresh business in bars has declined.

The mill price of 2.10c., Chicago, on plates, shapes and bars is firm, and producers are now making an effort to obtain 2.25c. on lots of less than 100 tons each. Specifications from car builders are light, and although a fair number of cars are up for figures, contracts are slow at being closed. The New York Central this week entered the market for 135 passenger, baggage, mail and milk cars.

The scrap market is dull, but prices show no marked tendency to soften. Railroad offerings of heavy melting steel which are not delivered on past obligations find a ready market among dealers, since it is almost impossible to get other grades of heavy melting past the mill inspectors.

Pig Iron.—The market is quieter than a week ago, although a few users are closing for fourth quarter requirements. Spot sales are fair, and in small tonnages for immediate delivery are bringing $21.50, furnace. Contracts and larger tonnages of Northern iron are being closed at $21, local furnace. The volume of shipments is being maintained, but some users are now finding that delivery schedules are not keeping pace with their current requirements. A few scattered lots of charcoal iron have been sold at $29.04, delivered Chicago. Increased interest in silvery is evidenced not so much by the volume of spot sales as in the number of contracts which are being renewed at present prices.

Fluorspar.—A few carlot sales have been made at $18, f.o.b. mines. An inquiry from the Birmingham district calls for 600 tons.

Quotations on Northern foundry high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	$21.00
Northern No. 1 foundry, sil. 2.25 to 2.75	21.50
Malleable, not over 2.25 sil.	21.00
High phosphorus	$21.00 to 21.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (all rail)	27.01
Southern No. 2 (barge and rail)	25.18
Low phos., sil. 1 to 2 per cent, copper free	29.50 to 30.00
Silvery, sil. 8 per cent	32.29
Bessemer ferrosilicon, 14 to 15 per cent	45.79

Ferroalloys.—Foreign spiegeleisen in the 18 to 22 per cent grade is still available, and is reported to be quoted at $34.50, New Orleans, to which must be added a freight rate of $7.56 for delivery to Chicago. A resale of small tonnage of domestic spiegeleisen in the 19 to 21 per cent grade is reported at $42.76, delivered Chicago. Several spot sales of ferromanganese have been made in this district at $88, seaboard.

We quote 80 per cent ferromanganese, $95.56, delivered Chicago; 50 per cent ferrosilicon, $85, delivered; spiegeleisen, 18 to 22 per cent, $41.76, delivered Chicago.

Plates.—Reports continue to be spread that the railroads will be heavy purchasers of equipment this fall, but as yet no formal inquiry has come from any of the lines operating out of Chicago. Car building shops continue at a fair rate of activity, but present contracts are rapidly nearing completion. Specifications from car builders this week totaled less than 3000 tons. Makers of oil storage tanks are busier, and mills have booked close to 7000 tons of material for tanks to be erected in the Texas oil fields. Deliveries on plates now range from four to six weeks, and mill prices are steady at 2.10c., Chicago, in lots of 100 tons and over. Mills insist that 2.25c. is being obtained for purchases of less than 100 tons each, this being an advance from the quotations of 2.20c. which prevailed a week ago.

The mill quotation on plates is 2.10c. per lb., base, Chicago.

Sheets.—The Inland Steel Co. has this week placed all 10 of its Milwaukee mills in operation. The demand for sheets has grown materially throughout the first half of August, and deliveries now range from three to four weeks. Light tank and stair and tread manufacturers are now taking fair tonnages of blue annealed, and specifications for black sheets from locker and metal furniture makers are in greater volume. Prices of sheets in this district are unchanged.

Chicago delivered prices from mill are 3.30c. for No. 28 black; 2.45c. for No. 10 blue annealed; 4.45c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Structural Material.—The demand for plain material holds up well, showing little change from the volume maintained throughout the month of July. On the whole, the larger fabricating shops are better supplied with work than the smaller ones, and the average bookings for all shops range from six to eight weeks. The list of pending projects is large. Plans on the Pittsfield Building, which will require close to 8000 tons, are expected to get into the hands of fabricators this week. In the Middle West, consisting of the States of Illinois, Indiana, Iowa, Wisconsin, Michigan, Missouri, Kansas, Oklahoma and Nebraska, over $154,000,000 worth of building and engineering work was placed in July. This represents a 7 per cent increase over June and a 54 per cent gain over July a year ago. Fabricators report a stiffening in the bids, and plain material is steady at 2.10c., Chicago. Mills are making an effort to obtain 2.25c. per lb., Chicago, for lots of less than 100 tons each.

The mill quotation on plain material is 2.10c. per lb. base, Chicago.

Bars.—Although July proved to be an unusually good month from the standpoint of new business and specifications in soft steel bars, it is now found that the average so far in August is slightly ahead of that maintained throughout the previous month. Specifications are unusually liberal, and deliveries are again advancing slowly. Business from the farm implement trade is expanding, and tonnage taken so far in August by the automobile manufacturers is heavier than during July. Sales of billet steel bars during July were the heaviest in the history of the local steel trade. The mill price of soft steel bars is firm at 2.10c., Chicago, and 2.25c. is being obtained on orders for less than 100 tons. Railroad specifications for iron bars were in good volume this week, and mill backlogs range from two to three weeks. There is a fair amount of new business, and prices are steady at 2c., Chicago. The Chicago Heights rail steel mill of the Inland Steel Co. will go down the end of this week, and operations will not be resumed for about 10 days when electrification will be completed. There is a heavy demand for hard steel bars for concrete reinforcement. One thousand tons of rail steel bars was placed this week for an apartment building in Chicago. Mill backlogs range from six to eight weeks, and users, who are still taking material at a rate which closely conforms with consumption, are pressing for prompt shipments.

Mill prices per lb. are: Mild steel bars, 2.10c., base, Chicago; common bar iron, 2c., base, Chicago; rail steel bars, 2c., base, Chicago.

Rails and Track Supplies.—There is a fairly active demand for rails and track supplies in small lots. One order for miscellaneous supplies totaled 1000 tons, and several small rail orders totaled 3300 tons. One mill booked 10,000 kegs of spikes and 3500 tons of steel tie plates. Rail mill operations have slowed down considerably since the peak reached in June, but one maker reports that its August schedule calls for full opera-

tion and its September schedule better than 50 per cent of capacity.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, $36 to $38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. per lb. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.25c. to 2.35c. mill; angle bars, 2.75c. mill.

Cast Iron Pipe.—The aggregate tonnage placed during the week bulks large. Although a number of sizable tonnages are before the trade, an unusual amount of business is coming from small municipalities, requiring lots of less than 100 tons each. Quotations remain at $40 to $41, base Birmingham, for 6-in. and larger pipe, but there is a tendency for the higher figure to become the minimum price. The United States Cast Iron Pipe & Foundry Co. was the only bidder on the large sized pipe recently placed by Milwaukee. One hundred sixteen tons of 36-in. and 42-in. plain straight pipe was taken at $38.40, Birmingham, or $46.90, delivered, 172 tons of 36 and 42-in. lugged pipe was taken at $58.40, Birmingham, or $66.90, delivered, and 157 tons of 20, 30, 36 and 42-in. special fittings brought a price of $140, delivered. It is reported here that Detroit placed 3000 tons of 36-in. Class C and about 1500 tons of 6-in. Class B pipe with the United States Cast Iron Pipe & Foundry Co. and 600 tons of 6-in. Class B pipe with the National Cast Iron Pipe Co. Detroit also placed 300 tons of 6-in. Class B with the Lynchburg Foundry Co. Mundelein, Ill., is preparing specifications on 150 tons of 6, 8 and 10-in. Class B pipe, and Lisle, Ill., placed 200 tons of 4, 6 and 8-in. Class B pipe with the National Cast Iron Pipe Co.

We quote per net ton, delivered, Chicago, as follows: Water pipe, 4-in., $52.20 to $53.20; 6-in. and over, $48.20 to $49.20; Class A and gas pipe, $4 extra.

Reinforcing Bars.—Competition among local dealers is keen, and further price weakness is in evidence except in the case of very small tonnages. It is reported that billet steel bars have gone as low as 2.25c., local warehouse, in lots not to exceed 125 tons each. These orders may be exceptions, but in the bulk of transactions prices do not average over 2.40c., warehouse. Awards are not so numerous this week, but dealers do not look for this situation to extend over any considerable time for the reason that architects as a whole are busy. New inquiry this week bulks fairly large. Awards and new projects are shown on page 458.

Coke.—Chicago producers continue to operate at full capacity, and shipments are going forward steadily. Prices are $9.75, district ovens, and $10.25, delivered in the Chicago switching district.

Bolts, Nuts and Rivets.—Specifications from the agricultural implement makers are slightly heavier. The bolt and nut market is steady and prices are firm.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Mild steel bars	3.00c.
Reinforcing bars, billet steel	2.40c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Hoops	4.15c.
Bands	3.65c.
No. 28 black sheets	4.10c.
No. 10 blue annealed sheets	3.50c.
No. 28 galvanized sheets	5.25c.
Standard railroad spikes	3.55c.
Track bolts	4.55c.
Structural rivets	3.50c.
Boiler rivets	3.70c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	47½
Coach or lag screws	55 and 5
Hot-pressed nuts, square, tapped or blank,	3.25c. off per lb.
Hot-pressed nuts, hexagons, tapped or blank,	3.75c. off per lb.

No. 8 black annealed wire, per 100 lb	$3.30
Common wire nails, base, per keg	3.05
Cement coated nails, base, per keg	3.05

Large rivets are still quotable at $2.65 to $2.75, Chicago, but the bulk of transactions are at the lower figure.

Wire Products.—Specifications from the manufacturing trade are expanding, and it is believed that shipments are being consumed as rapidly as ordered and that stocks in the hands of buyers are low. Jobbers are buying more liberally in preparation for the fall trade. Demand for wire products is active throughout the entire country, with the exception of the Northwest, which seasonally lags two to three weeks behind other sections. Mill operations are close to 60 per cent of capacity, and producers are making no effort to build up stocks above the average which has been maintained thus far this year.

Old Material.—For the second consecutive week prices of scrap have held without change. On the whole, the market is quiet except for a fair amount of trading between dealers who have obligations to fill. Buyers are making few commitments, but are freely taking shipments against contracts. Dealers are trading in heavy melting steel at $14 to $14.25, and this grade brought $14.75 per gross ton, delivered, on the Santa Fe list which closed recently. Inspection at local mills is very rigid, and rejections of other than clean railroad steel scrap are running high. Some grades usually classed as heavy melting steel are in demand south of Chicago, and within the past few weeks a fair tonnage has found an outlet in that direction. There is a fair amount of inquiry from gray iron foundries. Railroad lists include the Great Northern, 4600 tons; the Wabash, 2500 tons, and the Chesapeake & Ohio, 9000 tons.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

	Per Gross Ton	
Heavy melting steel	$14.00 to	$14.50
Frogs, switches and guards, cut apart, and miscellaneous rails	16.00 to	16.50
Shoveling steel	14.00 to	14.50
Hydraulic compressed sheets	12.50 to	13.00
Drop forge flashings	9.50 to	10.00
Forged cast and rolled steel car wheels	18.00 to	18.50
Railroad tires, charging box size	18.50 to	19.00
Railroad leaf springs, cut apart	18.50 to	19.00
Steel couplers and knuckles	17.50 to	18.00
Coil springs	18.50 to	19.00
Low phos. punchings	17.00 to	17.50
Axle turnings, foundry grade	14.50 to	15.00
Axle turnings, blast fur. grade	12.50 to	13.00
Relaying rails, 56 to 60 lb	25.50 to	26.50
Relaying rails, 65 lb. and heavier	26.00 to	31.00
Rerolling rails	17.00 to	17.50
Steel rails, less than 3 ft	17.50 to	18.00
Iron rails	14.50 to	15.00
Cast iron borings	11.25 to	11.75
Short shoveling turnings	11.25 to	11.75
Machine shop turnings	7.25 to	7.75
Railroad malleable	17.75 to	18.25
Agricultural malleable	15.50 to	16.00
Angle bars, steel	16.25 to	16.75
Cast iron car wheels	16.00 to	16.50
Per Net Ton		
No. 1 machinery cast	17.00 to	17.50
No. 1 railroad cast	16.25 to	16.75
No. 1 agricultural cast	16.25 to	16.75
Stove plate	14.50 to	15.00
Grate bars	14.25 to	14.75
Brake shoes	13.75 to	14.25
Iron angle and splice bars	14.00 to	14.50
Iron arch bars and transoms	20.00 to	20.50
Iron car axles	24.00 to	24.50
Steel car axles	17.50 to	18.00
No. 1 railroad wrought	13.50 to	14.00
No. 2 railroad wrought	12.50 to	13.00
No. 1 busheling	11.50 to	12.00
No. 2 busheling	7.50 to	8.00
Locomotive tires, smooth	17.00 to	17.50
Pipes and flues	10.00 to	10.50

Nine locomotives, part of a great quantity of railroad equipment and supplies, which were assembled in Seattle by the Russian Government during the World War for shipment to Vladivostock, but never moved, have been sold to the Anglo-Chilean Consolidated Nitrate Co. They will be sent in boats of the Grace Line to Tocopilla, Chile.

Cleveland

Mill Operations Expand—More Interest Shown in Pig Iron

CLEVELAND, Aug. 10.—Better rates of mill operation, an increased volume of specifications, continued receipt of inquiry and larger shipments of finished steel and pig iron are some of the salient features of the market situation. Lake Superior iron ore shippers and Lake vessel men are feeling the impetus of expanding works operations and now are putting on more speed to get down the ore. Coal has been taken to the Northwest in sufficient volume for the present, and vessel managers are bending their energies to the handling of ore. Since the grain trade as yet has made little call upon the vessel trade for tonnage, this is leaving the ore shippers in command of the situation today. They are taking advantage of it by sending contract vessels back light in order to hurry down more ore.

Pig Iron.—Renewed interest is being shown in pig iron, despite the heavy purchasing that was done along the Great Lakes in June. Demand, as was the case in June, is for foundry and malleable grades largely, some of it for fourth quarter delivery. The automotive interests in Michigan have joined in the buying of pig iron. Consumers not only are asking the furnaces for prompt shipment on third quarter purchases, but they also are asking that additional tonnages be added to former purchases. The Detroit producer has advanced its price 50c. a ton and now is on a flat basis of $20, base furnace. The Toledo furnace is also taking a firmer stand on prices. With a greater demand for steel-making irons being made upon the Cleveland producer who has been making the market here of late, the situation here may strengthen shortly.

Quotations below, except on basic and low phosphorus iron are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6.01 from Birmingham:

Basic, Valley furnace	$17.50
N'th'n No. 2 fdy., sil. 1.75 to 2.25	19.50
Southern fdy., sil. 1.75 to 2.25...$26.51 to	27.01
Malleable	19.50
Ohio silvery, 8 per cent	30.52
Standard low phos., Valley furnace	27.50

Semi-Finished Steel.—Demand for sheet bars has broadened out somewhat, and billets have been more actively sold than in several months. Mills continue to quote $36, Cleveland or Youngstown, for sheet bars and $35 for slabs and large billets.

Strip Steel.—More demand has appeared for hot-rolled strip, especially for wide strip, which is fairly firm at 2.30c., Pittsburgh. There is also a greater call for narrow strip, with deliveries being extended to two to four weeks and prices steady at 2.50c., Pittsburgh. Most makers hold to 3.60c. on cold-rolled strip.

Structural Shapes.—No large tonnages appear in prospect at the moment, but many small lots continue to be booked by the mills and deliveries are extending. Some important producers are 10 days to three weeks behind in some instances. The going quotation on such business as is being placed is 2c., Pittsburgh.

Alloy Steel Bars.—The northern Ohio mills have not been getting orders in the volume expected, in view of the revival in buying of other steel products. Quotations have been weak due to keen competition for what business is going. The automotive interests are not yet buying in the volume hoped for.

Sheets.—Slowly gathering headway, the sheet steel trade is marked this week by slightly increased rates of mill operations in northern Ohio and in the Youngstown district. Demand for black sheets made the greatest gain, with automotive sheets taking second place. Some mills continue to run at 100 per cent and none is operating at less than 90 per cent in the Valleys. Another good week's run of orders, in the opinion of the trade, may see the end of a minimum of 3c., Pittsburgh, for black sheets, while the price of 4.20c. on full-finished sheets no longer is questioned by consumers, who confine negotiations to delivery dates. The usual range of quotations on black sheets is 3.10c. to 3.15c., and some mills are refusing orders below 3.15c. for delivery after September. Blue annealed is quoted at 2.30c. and galvanized at 4.25c. to 4.30c.

Nuts, Bolts and Rivets.—The leading local rivet maker reports it took more business in July than in any previous month this year. With the volume of orders to nut and bolt makers running about 25 per cent greater than at this time last year, works are operating at 70 per cent of capacity. Buying of nuts, bolts and rivets continues active.

Warehouse Business.—Slow buying of sheets has been the feature of the warehouse trade here in the past week. However, with some jobbers July business in general ran ahead of June bookings, and so far in August purchases have been keeping up generally to the July rate. A fair sprinkling of orders to local jobbers is coming from manufacturing sources.

Old Material.—The market is quiet, with the mills doing very little buying. Traders profess being unable to account for this, because of the activity in pig iron of late, although they admit most of this activity has been in foundry and malleable grades. They expect mill buying to develop shortly, however, because of the high rate of mill operations which, they argue, should make purchases of scrap obligatory soon. While the market undoubtedly is weak, no formal changes in quotations are noted.

We quote per gross ton delivered consumers' yards in Cleveland:

Heavy melting steel	$14.75 to $15.00
Rails for rolling	16.25 to 16.50
Rails under 3 ft.	17.00 to 17.50
Low phosphorus billet, bloom and slab crops	18.00 to 18.50
Low phosphorus sheet bar crops.	18.25 to 18.75
Low phosphorus plate scrap	18.00 to 18.50
Low phosphorus forging crops	16.75 to 17.25
Cast iron borings	11.75 to 12.00
Machine shop turnings	10.50 to 10.75
Mixed borings and short turnings	11.75 to 12.00
Compressed sheet steel	13.00 to 13.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.75 to 14.25
Railroad malleable	18.00 to 18.50
Light bundled sheet stampings	11.25 to 11.75
Steel axle turnings	12.50 to 13.00
No. 1 cast	16.50 to 17.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling	11.75 to 12.00
Drop forge flashings, 15 in. and under	11.50 to 12.00
Railroad grate bars	12.50 to 13.00
Stove plate	12.50 to 13.00
Pipes and flues	10.00 to 10.50

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Mild steel bars	3.00c.
Cold-finished rounds and hexagons	3.90c.
Cold-finished flats and squares	4.40c.
Hoops and bands	3.65c.
No. 28 black sheets	3.81c. to 3.85c.
No. 10 blue annealed sheets	3.15c.
No. 28 galvanized sheets	4.70c. to 5.00c.
No. 9 annealed wire, per 100 lb.	$3.00
No. 9 galvanized wire, per 100 lb.	3.45
Common wire nails, base, per keg	3.00

Detroit Scrap Production Still Absorbed

DETROIT, Aug. 10.—Conditions indicate that a large tonnage of waste material will be moved during August and while the market shows no appreciable change, there is sufficient demand to take care of the production at prevailing prices.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	$13.25 to $13.75
Borings and short turnings	9.00 to 9.50
Long turnings	8.00 to 8.50
No. 1 machinery cast	17.00 to 18.00
Automobile cast	20.50 to 21.50
Hydraulic compressed	11.75 to 12.25
Stove plate	13.50 to 14.50
No. 1 busheling	11.25 to 11.75
Sheet clippings	7.50 to 8.00
Flashings	10.25 to 10.75

New York

Another Advance in German Pig Iron—Increased Steel Buying Expected

NEW YORK, Aug. 10.—For the second time in two weeks importers have been notified of an advance in the price of German pig iron. The first advance was only 25c. a ton and did not affect selling prices in this country, but the second is 75c., making a total of $1. That much of an increase in cost to the importer can hardly be ignored. The probable outcome will be an advance in quotations to American melters which will eliminate German iron as a competitive factor in this section. Meanwhile domestic furnaces have been taking most of the business placed. An eastern New York State furnace last week booked a total of 5000 tons, the major part of which, however, came from New England customers. In this immediate territory sales by local brokers totaled about 7000 tons. The Burnham Boiler Corporation, Irvington, N. Y., completed its purchases by placing 1500 tons of foundry for Lancaster, Pa., with a number of domestic producers. The inquiries of the Standard Gas Equipment Corporation, New York, and Abendroth Brothers, Port Chester, N. Y., are still pending. The Worthington Pump & Machinery Corporation has entered the market for 1780 tons of various grades for delivery through the last four months of the year. For Harrison, N. J., it wants 1160 tons of No. 2 plain, No. 1X and Bessemer; for Holyoke, Mass., 120 tons of No. 3, No. 2X and No. 1X; for East Cambridge, Mass., 300 tons of No. 2X, No. 1X and higher silicon foundry; for Laidlaw Works, Elmwood Place, Ohio, 150 tons of No. 2 plain and 50 tons of No. 1. No other large inquiries are reported. On the whole, foundry melt appears to have declined. The hot weather has adversely affected operations, and in some instances recessions in industrial activity have reduced the demand for castings. Foundries serving the rubber mill machinery industry and the textile machinery makers have curtailed output materially. The Charlotte, N. Y., furnace has been blown in, thereby introducing another competitive factor in this State.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.54 from Virginia:

East Pa. No. 2 fdy., sil. 1.75 to 2.25	$21.89 to $23.02
East Pa. No. 2X fdy., sil. 2.25 to 2.75	22.39 to 23.52
East Pa. No. 1X fdy., sil. 2.75 to 3.25	22.89 to 24.02
Buffalo fdy., sil. 1.75 to 2.25 (all rail)	22.91 to 23.91
No. 2 plain fdy., sil. 1.75 to 2.25 (by barge, del'd alongside in lighterage limits, N. Y. and Brooklyn)	20.00 to 21.00
No. 2 Virginia fdy., sil. 1.75 to 2.25	27.54 to 28.04

Ferroalloys.—British producers of ferromanganese reduced their price from $110 to $100, seaboard, as of Aug. 7, but naturally have taken no business as the alloy can be obtained at both $88, seaboard, and $95, furnace, depending on the seller. Practically no new business is reported, even as carload or small lots, but specifications on contract continue heavy. New business in spiegeleisen is also light at unchanged prices. Activity in 50 per cent ferrosilicon and in standard ferrochromium is confined to brisk specifications on contract.

Warehouse Business.—Prices on all products are holding at the quoted schedule, particularly black and galvanized sheets which seem unusually stable on the advance of the first day of the month. A few dealers continue to offer a lower price on 25 or more bundles of black sheets, notwithstanding the change as announced last week that 50 bundles would be the minimum for discount both in black and galvanized stock. Business continues to be very active, and one warehouse reports the first week of August on a par with, if not better than, any previous week this year.

Reinforcing Bars.—Awards continue to be few, with small tonnages in predominance. A sewer in Jamaica took 1000 tons, and the general contract has been let on a warehouse in New York, which will require 1000 tons. Contracts have been awarded on a few more small projects, requiring from 100 to 200 tons, but action is being delayed on a number of the larger pending inquiries. A bridge at Poughkeepsie, requiring 1000 tons, will not be built until next spring. Prices on domestic bars are unchanged at the quotations of last week, but a Newark warehouse with a fairly large stock of foreign bars has recently been quoting prices from $2 to $5 a ton less than those quoted by other warehouses, both on reinforcing and merchant bars. Concrete bars cut to length are reported to have been sold at 2.90c., including extras. This warehouse is owned by a German steel company.

Finished Steel.—Surprising as July steel business was in point of volume, the tonnage so far this month placed through local sales offices is keeping up at about the same rate. Considerable new buying is expected before the end of the month in view of the fact that many consumers specified in June only about enough steel to carry them through July and August, and they will need more to provide for the last four months of

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard	6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 28 gage)	6.35c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread	40 and 10
Carriage bolts, cut thread	30 and 10
Coach screws	40 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
½ in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	4	+19
¼-in. butt	11	+ 9
½-1½-in. butt	14	+ 6
2-in. lap	5	+14
2-6-in. lap	11	+ 6
7-12-in. lap	8	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100-lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass†

	Per Lb.
Nos. 18 to 20	4.30c.
Nos. 22 and 24	4.35c.
No. 26	4.40c.
No. 28*	4.50c.
No. 30	4.70c.

Sheets, Galvanized†

	Per Lb.
No. 14	4.60c.
No. 16	4.75c.
Nos. 18 and 20	4.90c.
Nos. 22 and 24	5.05c.
No. 26	5.20c.
No. 28*	5.50c.
No. 30	6.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.
†Lots of 50 bundles 25c. per 100 lb. less.

the year. Any intimation of rising prices, and there is now some talk along that line, particularly as to plates and sheets, may have the effect of driving in contract tonnage. Sheets have stiffened in prices with some mills as a result of the large buying of the past few weeks, and some of the plate mills are again talking of an advance in plates to 2c., Pittsburgh. Prices on sheets are irregular, but a few mills with good backlogs are quoting as their minimums 3.15c. on black, 2.30c. on blue annealed and 4.30c. on galvanized, Pittsburgh base. Lower quotations on black and galvanized are still available, but the improved situation is causing mills to hesitate about taking anything except for immediate specification at the low levels. Structural steel tonnage is exceptionally good for mid-summer. Interest locally is centered in the 32,000 tons of fabricated steel required by the Port of New York for two bridges from Staten Island to New Jersey. Bids will close on Aug. 20 and it is stated that the contracts will be awarded within a few days thereafter. The most disappointing feature of an otherwise encouraging steel situation is the absence of important railroad buying of cars and locomotives. On the inquiry for 29,750 boxes of tin plate for the Nippon Oil Co., the Iwai Co., Osaka, Japan, was low bidder and is expected to get the order, which, it now appears, will cover double the original number.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. per lb.; plates, 2.24c.; structural shapes, 2.24c. to 2.34c.; bar iron, 2.24c.

Coke.—Demand for foundry coke is still very light, and prices are unchanged at $4 to $5 per net ton, Connellsville. Furnace coke is said to be somewhat stronger. Delivered prices of Connellsville foundry coke are $7.91 to $8.91 to Newark and Jersey City, $8.03 to $9.03 to northern New Jersey, and $8.79 to $9.79 to New York or Brooklyn. By-product foundry coke ranges from $9.59 to $10.77, delivered Newark or Jersey City.

Old Material.—A resumption of buying by the mills has resulted in rather general advances in prices. Two eastern Pennsylvania steel plants have bought heavy melting steel at $17, delivered, or the equivalent of $13.50, New York. Brokers are active buyers of material but are finding it difficult to obtain in view of an increasing propensity on the part of dealers to hold scrap for further advances. For a mill having a freight rate of $2.65 offers have risen to a minimum of $15.50, delivered, or $12.85, New York, but little material can be obtained at that figure. Heavy breakable cast, rerolling rails, borings and turnings, and a number of other grades have also advanced. An eastern Pennsylvania mill with a freight rate of $3.50 paid $17, delivered, for heavy breakable cast.

Buying prices per gross ton, New York follow:

Heavy melting steel (yard)	$11.00 to 11.50
Heavy melting steel (railroad or equivalent)	12.85 to 13.25
Rails for rolling	13.25 to 13.75
Steel car axles	19.50 to 20.00
Iron car axles	23.00 to 23.50
No. 1 railroad wrought	14.25 to 14.75
Forge fire	10.50 to 11.00
No. 1 yard wrought, long	13.00 to 13.50
Cast borings (steel mill)	10.50 to 11.00
Cast borings (chemical)	13.00 to 13.50
Machine shop turnings	10.50 to 11.00
Mixed borings and turnings	10.50 to 11.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.25
Stove plate (steel mill)	11.00 to 11.50
Stove plate (foundry)	11.50 to 12.00
Locomotive grate bars	11.00 to 11.50
Malleable cast (railroad)	16.50 to 17.00
Cast iron car wheels	13.50 to 14.00
No. 1 heavy breakable cast	12.75 to 13.25

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$16.50 to $17.00
No. 1 heavy cast (column, building material, etc.), cupola size	15.00 to 15.50
No. 2 cast (radiators, cast boilers, etc.)	14.00 to 14.50

Cast Iron Pipe.—With pipe shops well booked and with considerable municipal business developing, the market has assumed a stronger aspect. Syracuse, N. Y., took bids yesterday on 3600 tons of 4 to 16-in. Class C pipe, and the Department of Water Supply, Gas and Electricity, New York, will receive tenders Aug. 19, on 10,000 tons of 6 to 20-in. The Donaldson Iron Co. will supply 175 tons of 30-in. which the department recently placed with a contractor. A number of contractors' jobs are still pending, among them 1070 tons of 6, 8 and 10-in. for North Wilbraham, Mass., and 369 tons of 6 and 8-in. for Asheville, N. C. Newburgh, N. Y., has awarded 105 tons of 6 and 12-in. to the Warren Foundry & Pipe Co. Fort Lauderdale, Fla., recently took bids on 10,000 tons.

We quote pressure pipe per net ton, f.o.b. New York in carload lots, as follows: 6-in. and larger, $50.60 to $52.60; 4-in. and 5-in., $55.60 to $57.60; 3-in., $65.60 to $67.60; with $5 additional for Class A and gas pipe.

Philadelphia

Larger Buying of Scrap and Basic Pig Iron—Steel Demand Steady

PHILADELPHIA, Aug. 10.—About 40,000 to 50,000 tons of heavy melting steel scrap and 16,000 tons of basic pig iron were sold in this market in the last week, being the greatest activity the scrap and pig iron markets have had in weeks. Sales of steel scrap were at $16 and $17, delivered, an advance of 50c. a ton, and practically all grades of old material have moved up in price, some advances being $1 and $1.50 a ton.

In the steel trade the steadiness of the demand is the striking feature. Local sales offices estimate the volume of orders received so far this month as being about on a par with the sales of the same number of days in the latter half of July. This is the more surprising in view of the fact that there is an absence of large-tonnage projects. Plates are the only product for which the August demand has shown a falling off, but this has been slight. One of the large orders of the week was 2000 tons of heavy-duty tie plates for the Pennsylvania Railroad.

Pig Iron.—Three companies bought basic pig iron within the week, one taking 10,000 tons, another 5000 tons and a third 1000 tons, all for early shipment. On the large order the delivered price was $21, but the smaller lots brought slightly higher amounts. Another steel company, whose requirements are covered only until the end of this month, will probably come into the market soon for a substantial tonnage. An Eastern subsidiary of the Steel Corporation, which recently bought 5000 tons of basic iron from an eastern Pennsylvania furnace, although ordinarily obtaining its iron from Pittsburgh furnaces, is expected to come into the market again soon if the volume of steel business continues to absorb a considerable part of the iron made at the Pittsburgh furnaces of the corporation. Sales of foundry iron have not been large. A malleable castings company is in the market for about 1000 tons of two grades of iron. Prices of foundry iron have not had a severe test in the week, but views of producers are inclining toward firmer quotations. All of the past week's business is reported to have been at $21, base, furnace, though in some instances furnaces have met the lowest freight rate to destination. In our table headed "A Comparison of Prices" the price given for foundry iron delivered at Philadelphia now applies to the base grade, No. 2 plain, 1.75 to 2.25 per cent silicon, instead of No. 2X, as formerly. Foreign iron is being sold in a limited way. German iron is available at $20, f.o.b. cars Philadelphia, for the base grade, with 25c. differentials for each higher grade of silicon content. Some foreign irons are bringing slightly higher prices.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$21.76 to $22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X	22.76 to 23.26
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.17 to 29.17
Basic delivered eastern Pa.	21.00 to 21.50
Gray forge	21.50 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	22.00 to 23.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00

Structural Shapes.—The largest new project before local fabricators is an apartment building on Walnut Street, calling for 1500 tons. Otherwise pending projects are mostly in small amounts, but there is a fair number of these. Eastern structural mills have backlogs assuring from one to two months' rollings if no additional business were to be received. Prices are generally on the basis of 2c., Pittsburgh. Buyers are shopping around for early deliveries to a greater extent than in some time, and on such orders the price receives secondary consideration. As high as 2.10c., Pittsburgh, has been paid for rush shipments.

Bars.—The volume of steel bar specifications holds up well, but new business is a little slow. Many consumers and jobbers have on file with the mills specifications covering their needs to the end of this month, but not all are protected through the entire quarter. Hence an improved demand is expected late in the month. No deviation from 2c., Pittsburgh, is reported on new business. Bar iron remains at 2.22c., Philadelphia.

Sheets.—A slightly firmer tendency is in evidence in sheets, largely due to the unwillingness of some mills to continue selling at the low levels recently prevailing. The improved demand for sheets is responsible for this firmer attitude. On black sheets quotations below 3.10c., Pittsburgh, are said to be less frequent. On galvanized there are still quotations of 4.20c., though some mills are trying to get 4.30c., Pittsburgh. Sales of blue annealed are usually at 2.30c., but $1 concessions are still being given to some of the larger buyers.

Imports.—Pig iron imports at Philadelphia last week totaled 2604 tons, of which 1394 tons came from England, 710 tons from Germany and 500 tons from France. Other imports were: Chrome ore from Portuguese Africa, 5206 tons; bar steel from Sweden, 114 tons.

Old Material.—Two mills situated close to Philadelphia came into the market last week for heavy melting steel, each buying about 10,000 tons at $17, delivered. Another Eastern mill, with more favorable freight rates from certain shipping points, paid $16 and is reported to have bought about 25,000 tons. With this buying activity, the whole market became very firm, with advances in prices of 50c. to $1.50 on many other grades. As high as $14.50, delivered, was paid for blast furnace borings and turnings, this price being 50c. higher than steel plants have paid for turnings for open-hearth use. The undertone of the market has been strong for weeks, due largely to the desire of owners of scrap to hold for higher prices. It is still difficult for brokers to buy against orders, as it has been for weeks, and as high as $16.75 has been paid against $17 orders for steel scrap. Another factor tending to add strength to the views of holders of scrap was the high prices offered by both dealers and consumers for material on the Pennsylvania Railroad's August list. The scrap trade looks for further advances. A steel mill which may be obliged to buy melting steel before the end of the month today was quoted $17.50, delivered.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	$16.00 to $17.00
Scrap rails	16.00 to 17.00
Steel rails for rolling	17.50 to 18.00
No. 1 low phos., heavy, 0.04 per cent and under	21.00 to 22.00
Couplers and knuckles	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Cast iron car wheels	17.50 to 18.00
No. 1 railroad wrought	18.00 to 18.50
No. 1 forge fire	14.50
Bundled sheets (for steel works)	14.00
Mixed borings and turnings (for blast furnace)	13.50 to 14.50
Machine shop turnings (for steel works)	14.00
Machine shop turnings (for rolling mills)	14.00 to 14.50
Heavy axle turnings (or equivalent)	15.00 to 15.50
Cast borings (for steel works and rolling mill)	14.00 to 14.25
Cast borings (for chemical plant)	15.00 to 15.50
No. 1 cast	17.50 to 18.50
Heavy breakable cast (for steel works)	17.00
Railroad grate bars	15.00
Stove plate (for steel works)	15.00
Wrought iron and soft steel pipes and tubes (new specifications)	15.50 to 16.00
Shafting	21.00 to 22.00
Steel axles	23.00 to 24.00

Ferroalloys.—An occasional sale of a carlot of ferromanganese is the only activity. Prices on domestic ferromanganese range from $88 to $95, furnace.

Billets.—There is very little demand for semi-finished steel, but Eastern mills are not anxious sellers as they need for their own finishing mills all the steel they are producing. Prices are unchanged at $35, Pittsburgh, for rerolling billets and $40 for ordinary forging billets.

Plates.—Some of the plate mills in the East report that sales so far this month are not quite up to the average of July business, but the falling off is slight. Some consumers have approached the mills with a view to contracting for their fourth quarter requirements, being actuated by reports which have reached them that an advance in price to 2c., Pittsburgh, is a possibility. So far no mill in this district has formally made known any intention of raising its price, but the opinion has been privately expressed by mill men that such an advance is likely if the demand is sufficient to warrant it. About 1200 tons of plates will be needed for the power plant of the Susquehanna Power Co. at Havre de Grace, Md., the total tonnage of steel required being about 5000 tons.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Tank steel plates, ¾-in. and heavier	2.80c. to 3.00c.
Tank steel plates, ¼-in.	3.00c.
Structural shapes	2.75c. to 2.90c.
Soft steel bars, small shapes and iron bars (except bands)	3.00c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	4.00c. to 4.25c.
Steel bands, No. 12 gage to ¼-in., inclusive	3.75c. to 3.90c.
Spring steel	5.00c.
No. 28 black sheets	4.35c.
No. 10 blue annealed sheets	2.40c.
No. 28 galvanized sheets	3.55c.
Diamond pattern floor plates—	
¼-in.	5.20c.
⅜-in.	5.50c.
½-in.	5.20c.
Rails	3.50c.
Tool steel	6.00c. to 6.50c.
Swedish iron bars	

Record Building Construction Reported

July construction volume in the United States is reported to have exceeded all previous months, according to the Associated General Contractors of America. The previous record month was in August, 1925, when the index was 221, based on the 1913 average at 100. The present position is given as 229, against a low figure of 120 last March.

Total construction during the first seven months of 1926 is reported as 4 per cent higher than for the corresponding period of 1925. This is noteworthy, in view of the lagging operations early in the year. The present phenomenal spurt started in May.

The rolling mill equipment recently purchased by the Reading Iron Co., Reading, Pa., from the McConway & Torley Co., Pittsburgh, will be erected and in operation at Reading within the next few months. The equipment consists of an electric driven Belgian mill, which will be used for rolling mill skelp.

In celebrating the twenty-fifth anniversary of its founding, the United Engineering & Foundry Co., Pittsburgh, issued a special edition of United Effort, its employees' plant magazine. It contains photographs of officers of the company, together with a history of its growth.

San Francisco

Lower Ocean Freight Rates on Steel—Utah Pig Iron Declines

SAN FRANCISCO, Aug. 7 (*By Air Mail*).—Freight rates on steel applying on water shipments to California from Atlantic ports via the Panama Canal have been placed on the "open list" by several of the so-called conference steamship lines. This virtually amounts to a reduction on ocean freight rates of about $1 a ton. For some time both the so-called conference and non-conference lines have been carrying plates and shapes from Atlantic ports to California at about 30c. per 100 lb. Recently several of the non-conference lines reduced their rates to 25c., which has resulted in a similar reduction by the conference lines. Opinions expressed in local shipping circles during the week intimate that an additional reduction by the non-conference lines is not unlikely. Most of the intercoastal carriers which are members of the conference are understood to have indicated that they will follow the lead already taken by some of the steamship companies, and will place steel on the "open list."

What this will mean to local buyers of plates and shapes is difficult to foresee at present. The leading Eastern mills continue to quote plates at 2.30c., c.i.f. Coast ports, and shapes at 2.35c. One independent mill during the week is understood to have quoted plates at 2c., Atlantic seaboard, and to have accorded the local buyer the privilege of shipping his order on an intercoastal carrier which is quoting a freight rate of 25c. This enabled a local firm to purchase plates at a price equivalent to 2.25c., c.i.f. Coast ports. It is doubtful, however, if the larger producers will be willing to quote on that basis.

During the week local importers received shipments of German coke totaling 7000 tons, and a local broker has received a shipment of 200 tons of special analysis English foundry iron. At Los Angeles 3200 tons of foreign cast iron pipe has come in. Belgian reinforcing bars have been quoted recently at 1.60c., duty paid, c.i.f. Coast ports, and Belgian structural shapes are quotable at about 1.75c.

Pig Iron.—A local importer has a shipment of Indian foundry iron en route, which is expected before the end of the month. Utah basic and foundry irons are now being quoted at $25 to $26 per gross ton, delivered in the San Francisco Bay district. Buying for the most part is confined to small tonnages.

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**English foundry, sil. 2.75 to 3.25	25.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	23.00 to 23.50
**Dutch foundry, sil. 2.75 to 3.25	22.50
**Belgium foundry, sil. 2.75 to 3.25	22.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings of fabricated steel for the week total 1510 tons. No fresh inquiries of importance have come up for figures. The largest individual letting of the week, 660 tons, for a bridge at Clark's Forge, Wash., was placed with an unnamed fabricator. Eastern mills continue to quote plain material at 2.35c., c.i.f. Coast ports.

Plates.—The 375 tons required by Bend, Ore., for two steel reservoirs, was placed with the Chicago Bridge & Iron Works. Bids on a pipe line job at Laguna Beach, Cal., which calls for 1500 tons, have been postponed one week. While Eastern mills continue to ask 2.30c., c.i.f. Coast ports, some buyers believe that a round tonnage could be placed at below that figure.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.30c.
Mild steel bars and small angles	3.30c.
Small channels and tees, ¾-in. to 2¾-in.	3.90c.
Spring steel, ¾-in. and thicker	7.00c.
No. 28 black sheets	4.90c.
No. 10 blue annealed sheets	3.90c.
No. 28 galvanized sheets	6.00c.
Common wire nails, base per keg	$3.75
Cement coated nails, base per keg	3.00

Bars.—Reinforcing bar lettings for the week total 2545 tons, 1470 tons of which was placed in the San Francisco Bay district. The largest individual letting, 720 tons, was for a warehouse in this city. Local concrete bar jobbers quote as follows: 2.80c., base, per lb. on lots of 250 tons; 2.95c., base per lb. on carload lots, and 3.20c., base, on less than carload lots.

Cast Iron Pipe.—Santa Ana, Cal., has placed 798 tons of 42-in. Class B cast iron pipe with the Butte Electrical Equipment Co., San Francisco, and the Santa Catalina Island Co., Santa Catalina Island, Cal., has awarded 325 tons of 6, 8 and 10-in. Class D pipe with B. Nicoll & Co. San Diego, Cal., will take bids Aug. 23 on 131 tons of 4, 6 and 8-in. Class B pipe, and Redwood City, Cal., is taking bids on 143 tons of 4 and 6-in. Class B. Quotations are unchanged at $50 to $52 per net ton, base water shipment, San Francisco.

Steel Pipe.—The Pacific Gas & Electric Co., San Francisco, is taking bids on 638 tons of 3½-in. line pipe.

Warehouse Business.—Generally orders are numerous, but individually they are small. Some jobbers report a slight improvement in demand since the first of the month. Quotations are unchanged.

Rails and Track Supplies.—Inquiries are few and invariably small.

Sheets.—Pacific Coast sheet mills are fairly active, and some slight improvement in demand is reported by local representatives of Eastern mills. Quotations are as follows: Galvanized sheets, 4.20c. to 4.30c., base, Pittsburgh; blue annealed sheets, 2.25c. to 2.30c., base, and black sheets, 3.10c. to 3.15c., base.

Coke.—Local importers have received shipments during the week from Germany totaling 7000 tons. Demand has fallen off slightly, as most of the local users have covered on their present requirements. German by-product coke is quoted at about $12 to $12.50 per net ton at incoming dock.

Birmingham

Alabama Blast Furnaces Expected to Equal 1917 Production Record

BIRMINGHAM, Aug. 10.—Indications point to sustained production of pig iron during the remainder of the year, and while output will be adversely affected this month because of the blowing out of a Gulf States Steel Co. furnace, it is estimated that Alabama production will average close to 247,500 tons per month. For the first seven months of the year Alabama produced 1,698,154 tons of pig iron, nearly 7000 tons more than for the same period last year. Total output for 1926, it is believed, will closely approach, if it does not exceed, the record production of 2,953,705 tons in 1917. While current buying is limited to small lots, a considerable amount of prospective business is reflected in an increasing number of feelers put out to test the price situation. The larger melters, particularly the pressure pipe makers, are among those sounding out the market, although they are still withholding their purchases. Some fourth quarter buying is expected to develop before Sept. 1. Quotations remain unchanged at $21, Birmingham, for No. 2 foundry iron.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil	$21.00
No. 1 foundry, 2.25 to 2.75 sil	21.50
Basic	21.00
Charcoal, warm blast	30.00

Rolled Steel.—Production and shipments remain heavy, and there are no indications that surplus stocks have been accumulated at the mills. The Steel Corporation is operating its open-hearth department at capacity and is running its finishing mills full with the exception of two or three mills which are being run light so that the steel may be rolled into products for which the demand is most urgent. Repairs to the open-hearth furnaces of the Gulf States Steel Co. are expected to be completed next week. This company has

an ample stock of billets on hand, and its mills are running at a high rate, among them its new bar mill, which began operations a few weeks ago. The output of the Ensley rail mill is still large. Bars and structural shapes are holding at 2.15c. to 2.25c. per lb., base Birmingham, and tank plates remain at 2.05c. to 2.15c.

Cast Iron Pipe.—Shipments of pressure pipe are unabated, and production has increased somewhat. Stocks on shop yards, however, are not excessive. Heavy deliveries are being made to the Northwest, and shop backlogs are expected to be increased materially by business which will be closed during the current month. Prices are steady at $40 to $41 per net ton, Birmingham, on 6-in. and larger diameters.

Coke.—Sufficient new business has developed to remove apprehensions of overproduction of foundry coke. Independent coke plants are now confident of maintaining operations at a high rate. Several sizable contracts calling for extended deliveries have been closed, and an increasing volume of buying for fall and winter requirements is looked for. Foundry coke remains unchanged at $5.50 per net ton, Birmingham, with $6 ruling on spot business and small tonnages.

Old Material.—Deliveries are being made against old contracts without cancellations or pressure for shipments. Little buying is being done, although some interest is being shown in cast scrap. Users of heavy melting steel are postponing further purchases until they have used up material in stock or still due them. In view of the slack demand, heavy melting is weak at $13.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	12.00 to 13.00
Railroad wrought	12.00 to 13.00
Steel axles	17.00 to 18.00
Iron axles	17.00 to 18.00
Steel rails	13.00 to 14.00
No. 1 cast	16.50 to 17.00
Tramcar wheels	16.00 to 17.00
Car wheels	16.00 to 16.50
Stove plate	14.00 to 14.50
Machine shop turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
Rails for rolling	15.00 to 16.00

Boston

New York State Furnaces Make Good Sales—Scrap Advances

BOSTON, Aug. 10.—Pig iron sales the past week approximated 9000 tons, mostly for fourth quarter shipment, with New York State furnaces again taking the bulk of the business. Sales included 5000 tons of No. 1X and No. 2X New York State iron to a Massachusetts machinery maker; 1000 tons of No. 2X, split among several furnaces, to another Massachusetts machinery maker; and the rest in tonnages under 1000 tons. New York State No. 2X iron was sold in small lots at $19.50, furnace, but on round tonnages $19, base furnace, was cut. The Mystic Iron Works has taken additional tonnages at $20, base Everett, and has notified the foundry trade that it expects to blow in the last of this month or early in September. Western Pennsylvania, Buffalo and Indian irons figured in recent transactions at delivered prices above those made on New York State, but they can hardly be classed as market factors. The H. B. Smith Co., Westfield, Mass., is sounding out the market on a round tonnage of No. 2 plain iron for fourth quarter, and the Worthington Pump & Machinery Corporation is inquiring for 420 tons of mixed grades, 300 tons for its East Cambridge works and the balance for its Holyoke, Mass., plant.

We quote delivered prices on the basis of the latest sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	$24.15 to $24.65
East. Penn., sil. 2.25 to 2.75	24.65 to 25.15
Buffalo, sil. 1.75 to 2.25	22.91 to 23.91
Buffalo, sil. 2.25 to 2.75	23.41 to 24.41
Virginia, sil. 1.75 to 2.25	27.92 to 28.42
Virginia, sil. 2.25 to 2.75	28.42 to 28.92
Alabama, sil. 1.75 to 2.25	30.60
Alabama, sil. 2.25 to 2.75	31.10

Finished Material.—Plates are firm at 1.90c. per lb., base Pittsburgh, with demand somewhat lighter than in July. The open price on shapes is still 2c., base Pittsburgh, but fabricators maintain they can do 1.90c. on sizable tonnages. The demand for bars is moderately active, and the market firm at 2c., base Pittsburgh. The Boston & Maine Railroad last week received another consignment of several thousand tons of German rails.

Cast Iron Pipe.—Boston has awarded 300 tons of 24-in. pipe to the Warren Foundry & Pipe Co., and the same company has taken a round tonnage of 10-in. pipe from Marblehead, Mass. Marblehead also has taken bids on 20-in. pipe for its new sewer outfall, but has made no award. These are the only municipal lettings reported the past week. Private pipe business holds up remarkably well. The market on small pipe continues firm, while that for large sizes is still more or less subject to price concessions. Prices quoted openly on pipe are: 4-in., $60.10 a ton, delivered common Boston freight rate points; 6 to 12-in., $55.10 to $56.10; larger pipe, $54.10 to $55.10. The usual $5 differential is asked on Class A and gas pipe.

Old Material.—The market for scrap suitable for steel mills is stronger and more active than it has been in months. Activity centers very largely among dealers, however. One Pennsylvania mill has just contracted for heavy melting scrap at $17 a ton, delivered, but steel makers in general are still resisting any advance in prices. Heavy melting steel at $11.50 to $12 a ton on cars, specification pipe at $10.50 to $11, machine shop turnings at $9 to $9.50, and forged scrap and bundled skeleton at $9.50 to $10, are all about 50c. a ton higher than a week ago, and chemical borings at $10.50 to $10.75, and mixed borings and turnings at $8.50 to $9, are about 25c. higher. Because more New England foundries than ever before are using New York State pig irons and therefore can use greater quantities of scrap, it is anticipated here that machinery cast will soon be in greater demand. Current foundry requirements for this material are still being supplied from local or nearby yards.

The following prices are for gross-ton lots delivered consuming points:

Textile cast	$19.50 to $20.00
No. 1 machinery cast	19.00 to 19.50
No. 2 machinery cast	17.00 to 18.00
Stove plate	13.00 to 13.50
Railroad malleable	19.00 to 19.50

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.50 to $12.00
No. 1 railroad wrought	12.50 to 13.00
No. 1 yard wrought	11.25 to 11.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	10.50 to 11.00
Machine shop turnings	9.00 to 9.50
Cast iron borings, chemical	10.25 to 10.75
Cast iron borings, rolling mill	9.00 to 9.25
Blast furnace borings and turnings	8.50 to 9.00
Forged scrap	9.50 to 10.00
Bundled skeleton, long	9.50 to 10.00
Forged flashings	9.50 to 10.00
Bundled cotton ties, long	8.25 to 8.50
Bundled cotton ties, short	9.00 to 9.50
Shafting	15.50 to 16.00
Street car axles	15.50 to 16.00
Rails for rerolling	12.50 to 13.00
Scrap rails	11.25 to 11.75

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Soft steel bars and small shapes	3.265c.
Flat, hot rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Plates	3.365c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hexagons	3.95c.
Squares and flats	4.45c.
Toe calk steel	6.00c.

Coke.—Specifications against last half contracts for by-product foundry coke have been coming in a little more freely, according to the New England Coal & Coke Co. and the Providence Gas Co., but shipments are far from active. Over a period of years, August by-product coke prices have been the lowest of the year. Current specifying is by those foundries which look for higher, rather than lower, fuel prices. New England producers quote foundry coke at $12 a ton delivered within a $3.10 freight rate zone. The Providence Gas Co. has received another cargo of Dutch coke, 4000 tons, which will be used in its gas plant.

Cincinnati

Pig Iron Market Has Stronger Tone—Scrap Advances

CINCINNATI, Aug. 10.—Despite the fact that the pig iron market is devoid of important sales, shipments to consumers in this territory have been liberal in volume. Little effort is being made by southern Ohio furnaces to interest buyers. One Ironton producer has a full order book for the third quarter; another, believing that foundry iron is likely to advance in the next two months, is not actively soliciting business at present prices. A few sales at $20, base, Ironton, have been reported, but $19.50 still is being quoted on sizable tonnages in highly competitive territory. Alabama iron is being sold in small lots at $20.50 to $21, base Birmingham, while Tennessee iron is quoted nominally at 21, base Birmingham. There are signs of increasing activity in Jackson County silvery. A nearby consumer has taken 250 tons, and several other melters have purchased single carloads. Valley foundry iron at $18, base furnace, has penetrated this market, but sales have been confined to small tonnages. The Worthington Pump & Machinery Corporation is expected to buy 200 tons of foundry iron for its local plant.

Based on freight rates of $3.69 from Birmingham and $1.89 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	$24.19 to $24.69
Alabama fdy., sil. 2.25 to 2.75	24.69 to 25.19
Tennessee fdy., sil. 1.75 to 2.25	24.69
Southern Ohio silvery, 8 per cent	30.39
So. Ohio fdy., sil. 1.75 to 2.25	21.39 to 21.89
So. Ohio malleable	20.89

Reinforcing Bars.—The Truscon Steel Co. will supply 100 tons of bars for the Red Bank grade crossing in this city. Bids close this week on about 300 tons for the Chamber of Commerce Building here, while the letting of 400 tons for the Hamilton Community Hotel, Hamilton, Ohio, is expected soon. New billet bars continue to sell at 2c., base Pittsburgh, and rail steel bars at 1.90c., mill.

Warehouse Business.—Sales have been sustained at a fairly satisfactory level during the past week. Weakness in structural steel and cold-rolled products has been offset by an active demand for bars, sheets and pipe. Nails are steady at $2.95 per keg, f.o.b. local warehouse, in this market, but concessions have been made by Louisville and Evansville jobbers. Prices on other commodities are firm and unchanged.

Finished Material.—In the first week of August bookings kept pace with those in the early part of July, which was a particularly active period. While buyers consistently refuse to anticipate their needs beyond 30 to 40 days, the steady flow of specifications and orders is indicative of a high production rate throughout consuming industries in this territory. Reports from rural districts in Indiana and Ohio state that crops are about normal in size and quality and that farmers probably will be active purchasers of sheet and wire products this fall. Despite the fact that an independent Eastern mill has been making concessions of from $1 to $2 a ton on black and galvanized sheets, the price situation in sheets, as well as in other finished goods, is favorable. Orders for galvanized sheets, especially from the South, are looked upon as the forerunner of a good fall roofing season. Mills are trying to obtain 4.30c., base Pittsburgh, in some instances, although 4.20c. still can be done on desirable lots. Black sheets are being held at 3.15c., base Pittsburgh. Reports of an advance of $2 a ton to 2.40c., base Pittsburgh, on blue annealed have been circulated, but 2.30c. is still being done. Automobile body sheets are quiet at the moment, with 4.20c., base Pittsburgh, the prevailing price. Several mills showed a gain in bar tonnage in the past week. Quotations stand at 2c., base Pittsburgh. Tank plates are available at 1.90c., base Pittsburgh, and structural shapes are holding firm at 2c., base Pittsburgh. Demand for wire products is light. Common wire nails continue to sell at $2.65 per keg, Pittsburgh or Ironton, and plain wire at $2.50 per 100 lb., Pittsburgh or Ironton. No structural awards of consequence were made in the past week, but fabricators anticipate a definite decision on several large pending jobs in the immediate future.

Coke.—Specifications for by-product foundry coke have held up fairly well, even though foundries are said to have reduced their operations somewhat. Beehive furnace coke from the Wise County district is in better demand and is selling at a minimum of $3.50, ovens. Foundry coke prices are unchanged.

Based on freight rates of $2.14 from Ashland, Ky., $3.53 from Connellsville, and $2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Connellsville foundry, $7.53 to $8.53. Wise County foundry, $7.09 to $7.59; New River foundry, $9.59 to $10.09; by-product foundry, $9.64.

Old Material. — Confident that consumers will resume buying on a large scale early in the fall, dealers are purchasing all available material for speculative purposes. The fact that they have only small stocks on hand and are competing vigorously for the various grades now being offered has caused heavy melting steel to advance 50c. a ton. Many other items also are commanding 50c. more than they did a week ago. Among the railroad lists closing this week are the Chesapeake & Ohio, 8800 tons; the Norfolk & Western, 4250 tons; the Virginian, 600 tons; the Louisville & Nashville, 7700 tons; and the Southern, 6250 tons. The total tonnage offered by the carriers includes 7000 tons of steel rails.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$13.50 to $14.00
Scrap rails for melting	13.50 to 14.00
Short rails	18.50 to 19.00
Relaying rails	27.00 to 27.50
Rails for rolling	14.50 to 15.00
Old car wheels	13.00 to 13.50
No. 1 locomotive tires	17.50 to 18.00
Railroad malleable	15.50 to 16.00
Agricultural malleable	14.50 to 15.00
Loose sheet clippings	8.00 to 8.50
Champion bundled sheets	10.00 to 10.50
Per Net Ton	
Cast iron borings	7.50 to 8.00
Machine shop turnings	7.00 to 7.50
No. 1 machinery cast	17.50 to 18.50
No. 1 railroad cast	14.50 to 15.00
Iron axles	20.50 to 21.00
No. 1 railroad wrought	10.00 to 10.50
Pipes and flues	8.50 to 9.00
No. 1 busheling	10.00 to 10.50
Mixed busheling	7.00 to 7.50
Burnt cast	7.50 to 8.00
Stove plate	10.00 to 10.50
Brake shoes	10.50 to 11.00

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, mild steel or iron	3.20c. to 3.30c.
Reinforcing bars	3.20c. to 3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
No. 28 black sheets	4.10c. to 4.30c.
No. 10 blue annealed sheets	3.60c.
No. 28 galvanized sheets	5.25c. to 5.40c.
Structural rivets	3.75c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base per 100-lb. keg	3.15
Chain, per 100 lb	7.55
	Net per 100 Ft.
Lap welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

Buffalo

One Blast Furnace Goes Out, Another In —Large Purchase of Heavy Melting

BUFFALO, Aug. 10.—The Donner Steel Co. has put out one of its two blast furnaces for relining. Total inquiry for pig iron in this district is about 6000 tons, including one of 1500 tons of various grades of foundry and another of 900 to 1000 tons of foundry and basic. Sales during the week have consisted principally of small lots. One furnace reports sales of several 100 and 200-ton lots and one 400-ton lot of foundry. The ruling price on business taken in the district is still $20, with the differentials for higher silicons being obtained. The McKinney Steel Co. has placed its Charlotte, N. Y., stack in blast. The Worthington Pump & Machinery Corporation is inquiring for 500 tons of foundry iron for its Buffalo plant.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdy., sil. 1.75 to 2.25	$19.00 to $20.00
No. 2X foundry, sil. 2.25 to 2.75	19.50 to 20.50
No. 1X foundry, sil. 2.75 to 3.25	20.50 to 21.50
Malleable, sil. up to 2.25	20.00
Basic	19.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—Steel mill operations range from 80 to 85 per cent in this district. Bars are firm at 2.265c. to 2.365c., delivered Buffalo, shapes at 2.265c. and plates at 2.165c. Sheet business is good, and apparently nothing less than 3.15c., base Pittsburgh, is being done on black. Structural business is being offered in small lots, although a few good-sized tonnages are pending. Reinforcing business has slowed a little, but is still good. A theater job requires 100 tons, and a local maker last week took 150 tons of road-building material. Warehouse business is good and shows a steady increase.

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Mild steel bars	3.30c.
Cold-finished shapes	4.45c.
Rounds	3.95c.
No. 28 black sheets	4.45c.
No. 10 blue annealed sheets	3.80c.
No. 28 galvanized sheets	5.60c.
Common wire nails, base per keg	$3.90
Black wire, base per 100 lb	3.90

Old Material.—Business has picked up, and prices have strengthened. One mill bought 10,000 to 15,000 tons of heavy melting steel in a grade which has been selling around $14.50 at $16, delivered mill yard. Dealers are making a very active market in competition for available heavy melting steel. Some have paid as high as $17. Railroad lists have brought $17.25 to $17.35 on railroad tracks, Buffalo, and one tonnage of rails brought $17.64, Buffalo. Demand for hydraulic compressed sheets has improved. On recent sales this grade has brought $16 to $16.50, Buffalo. Bundled sheets have been sold for $11 to $11.50. Demand for No. 1 cast and stove plate is active.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$15.50 to $16.00
Selected No. 1 heavy melting steel	17.00 to 17.50
Low phosphorus	18.50 to 19.00
No. 1 railroad wrought	15.00 to 15.50
Car wheels	17.00 to 17.50
Machine shop turnings	10.00 to 10.50
Mixed borings and turnings	12.00 to 12.50
Cast iron borings	12.00 to 13.00
No. 1 busheling	16.00 to 16.50
Stove plate	15.25 to 15.50
Grate bars	14.00 to 14.50
Hand-bundled sheets	12.00 to 12.50
Hydraulic compressed	15.00 to 15.50
No. 1 machinery cast	16.00 to 16.25
Railroad malleable	16.50 to 17.00
Iron axles	24.00 to 25.00
Steel axles	16.00 to 16.50
Drop forge flashings	13.75 to 14.25

Approval of the Underwriters Laboratories, Chicago, is reported for engines driving 750 and 1000-gal. centrifugal pumps and made by the Climax Engineering Co., Clinton, Iowa. These engines are made with either four or six cylinders, with 6 in. bore and 7 in. stroke.

British Process for Producing Sheets by Electrolytic Deposition

In view of the experimental work done in the United States in the production of finished iron by electrolytic deposition, it is of interest to note the operations on a commercial scale that are being carried on in Great Britain in the electrolytic production of black sheets and plates. The London *Metal Bulletin* refers to a process invented by F. W. Gauntlett, who has been working on it continuously and who is now producing sheets by this method at Scunthorpe, Lincolnshire.

Pig iron is taken direct from the pig bed at the blast furnace, placed in a bath, and an electric current passed through, which deposits upon a cathode pure iron in the form of sheets, the gage varying according to the length of time running and the amount of current used. The sheets are then stripped off and after annealing are ready for use, the metal being homogeneous and rolling therefore unnecessary, although the sheets could be put through the mill if considered desirable. Carbon and other impurities contained in the pig iron are absent from the black sheet.

The new process is carried on by unskilled labor and thus the saving from present-day sheet mill practice, involving much highly paid labor, is considerable, the inventor claiming an economy of £3 per ton. As there is no scale, the process is well adapted to the economical production of tin plate. Tests of the product made by producers of stampings show a high degree of ductility in electrolytic sheets, also a surface which tins and enamels well.

Shenango Furnace Co. to Make Ingot Molds

PITTSBURGH, Aug. 10.—The Shenango Furnace Co., operating two 600-ton blast furnaces at Sharpsville, Pa., as a means of using a greater portion of its pig iron production, has decided to enter the manufacturing field. It has just let a contract with the McClintic-Marshall Co. for the erection of a modern and fully equipped foundry for the production of ingot molds and other castings. The plant will be erected on the company's property and will be directly connected with the blast furnaces, which means a minimizing of transportation of the molten metal as well as the savings to be effected through concentration of facilities. Construction work will be rushed and it is expected the plant will be completed and ready for operation early next year.

Marketing Rolls of Styrian Steel

Erie steel rolls manufactured by the Schoeller-Bleckmann Steel Corporation, Vienna, Austria, for the cold rolling of metal sheets, strips, flat wires and foil, are being marketed in the United States by the Blake & Johnson Co., Waterbury, Conn. They are available in sizes from 11 lb. to 5060 lb., in diameters up to 20 in., and in any face up to 48 in. or any overall length up to 88 in.

These rolls are made from Styrian iron ore, reputed to be particularly free from sulphur and phosphorus. The steel is refined in the electric furnace. The rolls are offered as corresponding to American practice, smooth ground on the bodies. Necks are hardened if desired. For certain work, such as special strip steel, thin brass and various foils, rolls can be furnished with high polish or mirror finish. The hardness of the roll depends upon the size, but the surface test on a Shore scleroscope is said to range from 95 to 105.

The Inland Steel Co., Milwaukee division, has completed alterations in its sheet mills at Forty-third Avenue and Burnham Street, which provide a considerable increase in capacity. The mills resumed operations Aug. 8, after being closed about five weeks to permit the work to be completed.

CONCRETE REINFORCING STEEL

Bridge Over Lake Pontchartrain Takes 9500 Tons —Total Awards Exceed 16,500 Tons

Including a bridge over Lake Pontchartrain at New Orleans, reported let, which will take 9500 tons, the week's award of concrete reinforcing bars as reported to THE IRON AGE totaled more than 16,500 tons, an aggregate which has been exceeded but once during the year. An apartment building in Chicago took 1000 tons of rail steel, and a sewer job at Jamaica, L. I., N. Y., a like amount. No jobs of any size are included in the 1400 tons pending. Awards follow:

JAMAICA, L. I., 1000 tons, sewer construction, to Concrete Steel Co.

JAMAICA, 200 tons, sewer construction, 107th Avenue, to Concrete Steel Co.

NEWARK, N. J., 170 tons, warehouse for Mono Service Co., to Igoe Brothers.

NEWARK, 100 tons, warehouse for New York Telephone Co., to Igoe Brothers.

CINCINNATI, 100 tons, Red Bank grade crossing, to Truscon Steel Co.

NEW ORLEANS, 9500 tons, bridge over Lake Pontchartrain, reported awarded to Tennessee Coal, Iron & Railroad Co.

YORKVILLE, ILL., 130 tons of rail steel, State highway bridge, to Calumet Steel Co.

CHICAGO, 1000 tons rail steel, Middleman apartment building, to Inland Steel Co.

CHICAGO, 300 tons, Mercantile Building, to Concrete Engineering Co.

CHICAGO, 650 tons, Park Lane Apartment, to Concrete Steel Co.

CHICAGO, 200 tons of rail steel, to Inland Steel Co.

CHICAGO, 380 tons of rail steel, Lincoln Park, West, apartment, to Calumet Steel Co.

CHICAGO, 100 tons of rail steel, Fleetwood apartments, to Inland Steel Co.

HOT SPRINGS, ARK., 200 tons, Congress Hotel, to Concrete Engineering Co.

SAN FRANCISCO, 720 tons, warehouse for Ames-Harris-Neville Co., Seventeenth and Alabama Streets, to Cahill Brothers, San Francisco.

SAN FRANCISCO, 250 tons, display room for the Packard Motor Car Agency, Van Ness and Ellis Streets, to an unnamed local jobber.

OAKLAND, CAL., 300 tons, municipal wharf foot of Fourteenth Street, to an unnamed San Francisco jobber.

VALLEJO, CAL., 200 tons, for special work and improvements, to an unnamed San Francisco jobber.

LOS ANGELES, 575 tons, plant and warehouse for American Can Co., Forty-eighth Street and Santa Fe Avenue, to unnamed company.

SEATTLE, WASH., 300 tons, Ranke Building, to Pacific Coast Steel Co.

SEATTLE, 200 tons, public school, to Pacific Coast Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 1000 tons, warehouse, Lincoln Safe Deposit Co., general contract to John Lowry, Inc.

NEW YORK, 100 tons, Julius Kinderman Building, John G. Ahlers, general contractor.

WESTCHESTER COUNTY, N. Y., 100 tons, 4 bridges for Westchester Park Commission; general contract not let.

ORANGE, N. J., 150 tons, warehouse, Lincoln Safe Deposit Co., contract not let.

ELIZABETHPORT, N. J., 2400 tons, bridges to Staten Island; general contract, not to one company, as announced last week, but six jobs divided between the Triest Contracting Co. and the P. J. Carlin Construction Co.

ATLANTIC CITY, N. J., Jewish Community Center, 105 tons.

HARRISBURG, PA., memorial bridge, 200 tons.

CHICAGO, 125 tons, building at 173 West Madison Street; Louis Balkin, general contractor.

CHICAGO, 100 tons, State Bank of Chicago; A. Lanquist, general contractor.

CHICAGO, 200 tons, St. Vincent's Orphanage; general contractors, Dahl & Stedman.

CHICAGO, tonnage being estimated, Greenview Apartment; Paul F. Olson, architect.

CHICAGO, 100 tons, theater at Chicago and Lemont Avenues; W. P. Whitney, architect.

CHICAGO, tonnage being estimated, hotel at Sixty-seventh and Oglesby Streets; Hooper & Janish, architects.

CHICAGO, 200 tons, Knights of Columbus club house; Hall, Lawrence, Ripple & Ratcliffe, architects.

CHICAGO, tonnage being estimated, building at 329 Plymouth Court; Robert DeGolyer, architect.

Youngstown District Continues at High Operating Pace

YOUNGSTOWN, Aug. 10.—With a number of district independent steel producers in the Mahoning Valley, unfilled orders are near the year's peak, but a reduction is expected by the end of August, as bulk of third quarter buying has been done. Maintenance of a high operating rate in a month when production usually materially slackens indicates the demands which are being made upon mills for rolled products.

At its Sharon, Pa., works, the Carnegie Steel Co. has added five open-hearth furnaces, for a total of 15 active in this group; a skelp mill which had been idle for two years was placed in commission last week. Upon the completion of improvements now under way, one idle blast furnace in a group of three, will resume production. At its Farrell, Pa., works, the American Sheet & Tin Plate Co. is operating 30 tin mills, while 10 of the 12 sheet mills in its Mercer, Pa., group, are rolling.

The American Steel & Wire Co. is operating its plant in the Shenango Valley 5½ days per week, or virtually on a capacity basis.

Hot weather has been a deterrent to full production of puddling mills in the Mahoning Valley, while labor difficulties at the Girard works of the A. M. Byers Co. have also contributed to some curtailment.

This week the Republic Iron & Steel Co. contributed to enlarged rolled steel production by operating an additional skelp mill and its plate mill. In other directions, its production is being well sustained.

Except for its 14-in. strip mill, the Trumbull Steel Co. has all departments in commission. Its cold strip department is active at 75 per cent, but operations of the company in general average 95 per cent.

This week, the Carnegie Steel Co. reports a slight reduction in steel ingot production to 90 per cent, with bar mills averaging 82 per cent.

In the Mahoning Valley, 111 of 127 sheet and jobbing mills started the week, a gain of one over the preceding week.

Canadian Scrap Market Is Again Quiet

TORONTO, ONT., Aug. 10.—The demand for iron and steel scrap in the Canadian market has again reverted to a state bordering on stagnation. Melters are showing little interest in the market and are buying only in small quantities for immediate needs. Shipments against contracts, however, are going forward, and deliveries to the Hamilton district account for the greater part of the scrap moving in the Ontario district. Most small foundries are carrying sufficient stocks in their yards to carry them along for three or four weeks. In the Montreal market sales have also declined. Exports, however, are fairly good. There is little trading between dealers, and buying prices are unchanged except for a 50c. drop in heavy melting steel at Toronto.

	Toronto	Montreal
Per Gross Ton		
Steel turnings	$9.50	$6.00
Machine shop turnings	9.50	6.00
Wrought pipe	7.00	6.00
Rails	11.00	8.50
No. 1 wrought scrap	11.00	13.00
Heavy melting steel	10.50	7.50
Steel axles	16.00	17.00
Axles, wrought iron	18.00	19.00
Per Net Ton		
Standard car wheels	16.00	16.00
Malleable scrap	13.00	12.00
Stove plate	12.00	13.00
No. 1 machinery cast	16.00	18.00

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Aug. 10	Aug. 9	Aug. 7	Aug. 6	Aug. 5	Aug. 4
Lake copper, New York	14.62½	14.62½	14.62½	14.62½	14.62½	14.62½
Electrolytic copper, N. Y.*	14.25	14.25	14.25	14.25	14.25	14.25
Straits tin, spot, New York	66.00	65.10	....	65.50	65.12½	65.25
Lead, New York	9.00	9.00	9.00	9.00	9.10	9.10
Lead, St. Louis	8.75	8.75	8.75	8.75	8.85	8.85
Zinc, New York	7.65	7.65	7.65	7.70	7.75	7.75
Zinc, St. Louis	7.30	7.30	7.30	7.35	7.40	7.40

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Aug. 10.—Strength and steadiness continue to characterize most of the markets. Buying of copper has been light, but prices are very firm. There has been fairly heavy buying of tin at advancing quotations. Lead is easier but still firm. The zinc market is quieter with prices a little lower.

Copper.—The week has been a quiet one, but prices continue firm. Consumers seem well covered after the recent heavy buying and there has been very little activity by dealers. There has, however, been some buying each day, with electrolytic copper practically unchanged during the week at 14.50c., delivered, or 14.25c., refinery. On one or two days the metal is stated to have been available in quite limited quantities at 14.45c., delivered, but the quantity was so small as not to be much of a market factor. Demand for export is only moderate. It is stated that dealers, who made purchases on the way up are now taking profits, which explains in part the dullness both in the export market and in the market in general. Lake copper is quoted at 14.50c. to 14.62½c., delivered, depending on the destination.

Tin.—Marked activity at advancing prices is the story of the tin market. For the week ended Friday, Aug. 6, sales of probably 1500 tons were made, dealers being the principal buyers, evidently covering short sales. Consumers were continually showing more interest. The largest day of the week was 500 to 600 tons sold on Aug. 3, with Friday, Aug. 6, an active day at something more than 350 tons. An interesting feature during the week was the export of 90 tons of Banca tin from New York to the Continent. The market is pictured as full of cross currents and difficult to analyze. London is exceedingly speculative and bullish, but consumption and conditions here are exceedingly good. With prices where they are, short selling is considered rather dangerous. Yesterday the market was quiet with 150 tons for August delivery sold at 66c. to 66.10c. The market today has been quiet with spot Straits tin sold at 66c., New York. London prices today were about £2 to £3 per ton higher than a week ago, with spot standard tin quoted at £297 15s., future standard at £290 10s. and spot Straits at £305 15s. The Singapore price today was £297. Arrivals so far this month have been 1370 tons with 4721 tons reported afloat.

Lead.—The market is more quiet and easier, particularly as to premiums for early delivery, which are much less than a week ago. Demand, however, continues steady and consumption is very heavy. A sale is noted of one carload of lead, equivalent to 9.10c., New York, but it is also a fact that a carload of spot metal found no buyer at 8.95c. Quotations are somewhat confusing, but in the outside market the St. Louis price is 8.75c. to 8.85c. for early delivery, with the quotation of the leading interest unchanged at 8.90c., New York, as its contract price.

Zinc.—The statistics for July were made public today and showed a decrease in stocks as of Aug. 1 of about 2800 tons. The stocks on Aug. 1 were 22,987 tons as against 25,760 tons on July 1. The market has been exceedingly quiet during the week and prices have

Metals from New York Warehouse

Delivered Prices per Lb.

Tin, Straits pig	66.50c. to 67.75c.
Tin, bar	68.75c. to 70.25c.
Copper, Lake	15.50c.
Copper, electrolytic	15.25c.
Copper, casting	14.75c.
Zinc, slab	8.50c. to 9.00c.
Lead, American pig	9.50c. to 10.00c.
Lead, bar	11.50c. to 12.50c.
Antimony, Asiatic	16.00c. to 17.00c.
Aluminum, No. 1 ingot for remelting (guaranteed over 99 per cent pure)	30.00c. to 30.50c.
Babbitt metal, commercial grade	30.00c. to 35.00c.
Solder, ½ and ½ guaranteed	40.50c. to 40.75c.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	68.25c.
Tin, bar	71.25c.
Copper, Lake	15.00c.
Copper, electrolytic	15.00c.
Copper, casting	14.00c.
Zinc, slab	8.50c.
Lead, American pig	9.00c.
Antimony, Asiatic	16.50c.
Lead, bar	11.25c.
Babbitt metal, medium grade	22.50c.
Babbitt metal, high grade	73.50c.
Solder, 50-50	41.25c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

Sheets—	
High brass	19.37½c. to 20.37½c.
Copper, hot rolled	23.00c. to 24.00c.
Copper, cold rolled, 14 oz. and heavier	25.25c. to 26.25c.
Seamless Tubes—	
Brass	24.25c. to 25.25c.
Copper	25.00c. to 26.00c.
Brazed Brass Tubes	27.37½c. to 28.37½c.
Brass Rods	17.12½c. to 18.12½c.

From New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	13.00c. to 13.25c
Zinc sheets, open	13.50c. to 13.75c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products were advanced ¼c. per lb. on Aug. 3. Zinc sheets and lead full sheets are still being quoted at the advances of July 20 and 26 respectively.

List Prices Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. Per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	19.37½c.
Copper, hot rolled	23.00c.
Zinc	11.75c.
Lead (full sheets)	12.50c. to 12.75c.
Seamless Tubes—	
High brass	24.25c.
Copper	25.00c.
Rods—	
High brass	17.12½c.
Naval brass	19.87½c.
Wire—	
Copper	16.37½c.
High brass	19.37½c.
Copper in Rolls	21.87½c.
Brazed Brass Tubing	27.37½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	37.50c.
Tubes, base	48.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	19⅜c. to 20⅜c.
Copper, hot rolled	23c.
Copper, cold rolled, 14 oz. and heavier	25¼c.
Zinc	12.25c.
Lead, wide	11.25c.
Seamless Tubes—	
Brass	24¼c.
Copper	25c.
Brazed Brass Tubes	27⅜c.
Brass Rods	17⅛c.

eased off to 7.30c., St. Louis, or 7.65c., New York, a decline of about 10 points during the week. Sales have been only moderate with one galvanizer taking 400 tons for August-September delivery.

Nickel.—Wholesale lots of ingot nickel are quoted at 35c., with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Antimony.—Conditions in China have not improved and prices are higher than a week ago. Chinese metal for spot delivery is quoted at 17c., New York, duty paid, with September-October arrival at 16.50c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted today at 27c. to 28c. per lb., delivered.

Non-Ferrous Metals at Chicago

AUG. 10.—This market is not so active as a week ago, although there is still a fair amount of business being done. There is good demand for copper and the price is holding steady. The tin market has stiffened and prices are higher. Old metal quotations are steady and the demand is well sustained. We quote, in carload lots, Lake copper, 14.75c.; tin, 66c.; lead, 9c.; zinc, 7.40c.; in less than carload lots, antimony, 17.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.75c.; red brass, 9.25c.; yellow brass, 8c.; lead pipe, 7.50c.; zinc, 5c.; pewter, No. 1, 35c. tin foil, 43.50c.; block tin, 52c.; aluminum, 17.75c., all being dealers' prices for less than carload lots.

Old Metals, Per Pound, New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	12.25c.	13.50c.
Copper, heavy and wire	11.75c.	12.50c.
Copper, light and bottoms	10.00c.	11.25c.
Brass, heavy	7.25c.	9.00c.
Brass, light	6.25c.	8.00c.
Heavy machine composition	8.75c.	10.00c.
No. 1 yellow brass turnings	8.50c.	9.25c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	7.75c.	8.00c.
Lead, tea	5.75c.	6.50c.
Zinc	4.25c.	4.75c.
Sheet aluminum	17.00c.	19.00c.
Cast aluminum	17.00c.	19.00c.

Business Analysis and Forecast

(Concluded from page 437)

Exports of iron and steel declined in June and, considering the season, were nearly as poor as in January. It is true that the foreign demand for a few products such as tin plate has been excellent, owing to the difficulties in England, but in general the outlook for exports can hardly be called favorable.

Our net conclusion is that *no sharp further decline is probable in the composite demand for steel*, but that the *peak of that demand has been passed* and that it is likely to work gradually and irregularly lower. At present the adjustment between steel production and the potential requirements of steel-using industries is fairly close. No large contraction of the steel output is called for; a small, gradual decline probably would be sufficient to maintain stable conditions.

Orders and Sales of Finished Steel

OUR chart showing the trend of orders and sales of finished steel makes a favorable showing, though it is to be remembered that sheets make the chief item as to tonnage and that the sheet business, in spite of its volume, is not on a very profitable basis. In the first place, the June composite index of orders and sales turned upward and became the highest since March. In the second place, the average for the second quarter was higher than that for the first quarter. In fact, it was the best second-quarter period as to orders since 1922. In the third place, the cumulative total of orders and sales for the year to date has made the best showing since 1923.

Probably this favorable showing does not throw so much light on the future as would be the case if it represented forward buying to a greater extent. It is probably true that the large orders have been accompanied by heavy shipments and certainly it is true that unfilled orders are low. Backlogs are relatively small. On the other hand, this condition means that a quicker adjustment would result in case of a decline in business. There would be less trouble with cancellations.

Sales of sheets in June, amounting to over 284,000 tons, were the largest since March. Structural steel sales amounted to nearly 229,000 tons, which is a decrease from 232,000 tons in May. Bookings of steel castings have shown a steady decrease since March. Fabricated steel plate bookings in June amounted to only 37,400 tons, against 46,500 tons in the preceding month.

The curve of orders and sales agrees rather closely with the trend of our curve showing the rate of change in the unfilled orders of the Steel Corporation (to be shown next week). This confirms the reported increase in sales of steel.

Car and Locomotive Orders Lower

JULY orders for freight cars, though larger than a year ago, were sharply lower than in June. According to *Railway Age* there were 1258 freight cars ordered in July, against 4270 in June. Locomotive orders also declined, being only 14 in July, against 191 in June and 39 in July, 1925.

The trend of the moving averages shown in the third chart is clearly downward. A downward trend at this season, however, occurs in most years and appears to be largely normal. The decline in the surplus of freight cars as shown in the third chart is seasonal also, but on July 23 the surplus was only 218,627, which is considerably smaller than in either 1924 or 1925. It seems likely, therefore, that a good seasonal gain in freight traffic would reduce the surplus to such a low point that orders for additional equipment would be stimulated.

Schedule of the next installments of the **Business Analysis and Forecast**, *by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows:* **Aug. 19**—*Position of Iron and Steel Producers;* **Aug. 26**—*General Business Outlook;* **Sept. 9**—*Activity in Steel Consuming Industries.*

PERSONAL

Henry E. Smith, who has been named St. Louis district sales manager, Wheeling Steel Corporation, Wheeling, W. Va., succeeding Arthur H. Dufort, who resigned to become assistant manager of sales, Central Tube Co., has been identified with the steel trade for 18 years. From 1908 to 1914 he represented the Merchant &

R. F. SMITH

H. E. SMITH

Evans Co. in the Southeast, and, after a year in Chicago for that company, he represented the N. & G. Taylor Co., Philadelphia, for three years in Indiana, Ohio, and western Pennsylvania. He took charge of the Atlanta office, La Belle Iron Works, in 1919, and with the merging of that company into the Wheeling Steel Corporation in 1920 continued in the same capacity for the new organization. His brother, R. Frank Smith, who succeeds him as Atlanta district manager, has been engaged in steel sales since 1901. He also was identified for a long time with the Merchant & Evans Co., which he served as sales manager in Washington, Atlanta and Detroit before going to the Wheeling Steel Corporation's Atlanta office in 1901.

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Arthur H. Dufort, whose appointment as assistant manager of sales, Central Tube Co., Pittsburgh, was announced in THE IRON AGE last week, takes with him to his new position 14 years of mill and sales experience. He entered the employ of the Wheeling Steel & Iron Co. in 1912 and worked in the mills of that company until 1920, when he was transferred to the general sales department in Wheeling, and later that year to the Philadelphia district sales office as assistant to L. J. Lowe, district sales manager. On Jan. 1, 1926, he was promoted to St. Louis as district sales manager, the position he relinquished to make his new connection.

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Allen B. McDaniel, secretary and treasurer of the Research Service, Inc., Washington, who has acted as secretary of the Washington office of the American Association of Engineers for a number of years, has resigned his position with the association in order to devote all time to his own business. He is a member of the firm of Newell, Corse & McDaniel, consulting engineers and business representatives.

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Dr. Robert. J. Anderson, consulting metallurgical engineer, Cleveland, has just returned from a two months' trip to the Pacific Coast.

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C. R. Gould has been appointed general manager of the Standard Turbine Corporation, Scio, N. Y. He has been identified with turbine manufacture for twenty years, most recently with the Kerr Turbine Co., for which he was purchasing agent, treasurer and secretary.

Preston B. Postlethwaite has been elected president of the Wagner Electric Corporation, New York, to succeed Waldo A. Layman, who resigned several weeks ago. Mr. Postlethwaite had been vice-president of the company since 1923, and was also a member of the committee of four officials who had had charge of the operation of the concern since Mr. Layman's retirement. He entered the employ of the Wagner corporation in 1909 as an apprentice immediately after his graduation from Pennsylvania State College as an electrical engineer. He has been a director of the company for two years.

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H. G. Steinbrenner has been elected second vice-president of the Brown Hoisting Machinery Co., Cleveland, and will have charge of the marketing of the company's products.

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J. J. Tynan, vice-president Bethlehem Steel Corporation, San Francisco, recently left for a trip of several weeks in Europe, where it is reported that he will take up a number of important business matters with European steamship officials.

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F. W. T. Amis, for many years connected with the iron and steel industry, has resigned as manager of imports and exports of E. Arthur Tutein, Inc., New York, and is sailing for the Continent and Great Britain, where he will make a three months' stay, investigating industrial conditions.

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L. W. Scott Alter has been elected a director of the American Tool Works Co., Cincinnati, to succeed Walter B. Hofer, who recently resigned. Mr. Alter has been associated with the company for 20 years, and at present is director of purchases.

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Edgar S. Bloom, vice-president American Telephone & Telegraph Co., has been elected president of the Western Electric Co., succeeding Charles G. DuBois, who has been president for the past seven years and who will continue with the company as chairman of the board of directors.

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William H. Allen, recently connected with the Fellows Gear Shaper Co., Springfield, Vt., and prior to that sales manager Kearney & Trecker Corporation, Milwaukee, has again become associated with Charles H. Besly & Co., Chicago, manufacturer of grinders, abrasive disks and specialties. He served his apprenticeship with the Besly company at its Beloit, Wis., works and represented the sales department in Ohio and Michigan from 1904 until 1916. He will represent the company in northern New York and Pennsylvania, with headquarters at Buffalo.

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V. M. Wall, formerly assistant manager National Cast Iron Pipe Co., Los Angeles, has been transferred to the Chicago office of that company in the same capacity. He succeeds F. J. Egan, who has accepted the assistant sales managership of the cast iron pipe department of James B. Clow & Son, Chicago.

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Charles H. Morris has resigned as chief executive engineer, Sidney Blumenthal & Co., Shelton, Conn. He has not yet made a new connection, and is located for the present at 520 West 183rd Street, New York.

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Crispin Oglebay has been elected a director of the Republic Iron & Steel Co., succeeding his uncle, the late Earl W. Oglebay. For a number of years he has been chairman of the Ferro Machine & Foundry Co., Cleveland. He is also president of Oglebay, Norton & Co., Cleveland, dealers in Lake Superior iron ores.

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Joseph Igoe, president Igoe Brothers, Inc., Newark, is one of the directors of the new Guardian Trust Co. of New Jersey, which was opened at 900 Broad Street, Newark, on Aug. 2.

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George Damerel, for many years Eastern manager of sales, strip steel department, of the Weirton Steel Co., Weirton, W. Va., is now associated with the New York sales department of the Trumbull Steel Co., Warren, Ohio, at 3846 Grand Central Terminal.

Steel Corporation's Unfilled Orders Increase First Time This Year

The first increase this year in the unfilled orders of the United States Steel Corporation was registered in July. The total unfilled business on July 31 amounted to 3,602,522 tons, an increase of 123,880 tons over the 3,478,642 tons on June 30. The last increase was in December, 1925, with successive decreases from January to June, inclusive. A year ago the unfilled business was 3,539,467 tons or 63,055 tons less than at the end of July, this year. The following table gives the unfilled tonnage as reported by months beginning with January, 1924:

	1926	1925	1924
Jan. 31	4,882,739	5,037,323	4,798,429
Feb. 28	4,616,822	5,284,771	4,912,901
March 31	4,379,935	4,863,564	4,782,807
April 30	3,867,976	4,446,568	4,208,447
May 31	3,649,250	4,049,800	3,628,089
June 30	3,478,642	3,710,458	3,262,505
July 31	3,602,522	3,539,467	3,187,072
Aug. 31	.....	3,512,803	3,289,577
Sept. 30	.....	3,717,297	3,473,780
Oct. 31	.....	4,109,183	3,525,270
Nov. 30	.....	4,581,780	4,031,969
Dec. 31	.....	5,033,364	4,816,676

The high record in unfilled orders was 12,183,093 tons at the close of April, 1917. The lowest was 2,674,757 tons on Dec. 31, 1910.

British Steel Exports Continue to Fall—Imports Gain

British iron and steel exports have been contracting gradually since the coal strike went into effect and in June reached the lowest point this year. The total was 234,799 gross tons compared with 277,849 tons in May. Deducting scrap (3465 tons), the June total was 231,334 tons or about 25.6 per cent less than the corresponding average for 1925 of 310,900 tons per month. The June data, compared with the first half and with other years, are as follows:

Exports of Leading British Steel Products in Thousands of Gross Tons Per Month

	June 1926	6 mos. 1926	1925	1913
Pig iron and ferroalloys	25.5	38.5	46.6	93.7
Iron bars, rods and shapes	1.5	2.6	3.1	11.8
Steel bars, rods and shapes	13.8	20.4	19.8	20.9
Hoops and strips	3.7	4.6	5.1	3.8
Plates	4.3	9.2	9.9	11.2
Black plates and sheets	14.4	23.5	19.5	11.7
Galvanized sheets	39.7	61.5	59.4	63.5
Tin plates and sheets	35.6	41.8	42.6	41.2
Rails	18.7	24.4	17.3	42.2
Cast tubes, pipes and fittings	5.7	8.9	7.8	19.6
Wrought tubes, pipes and fittings	12.1	18.3	16.0	13.7
Wire and manufactures	6.3	9.1	9.8	9.6
Total for all exports (except scrap)	231.3	316.8	310.9	414.1

Imports expanded in June over May, 243,028 tons compared with 185,844 tons. Deducting scrap (9629 tons), the June imports were 233,399 tons as against 166,636 tons as the corresponding figure for May. These compare with a monthly average in 1925 of 234,900 tons (226,750 tons aside from scrap).

To Produce Standardized Galvanized Steel Industrial Buildings

Three Pacific Coast companies—the Pacific Coast Steel Co., the Pacific Sheet Steel Corporation and the Michel & Pfeffer Iron Works, all of San Francisco—have concluded arrangements for the production and distribution of standard galvanized steel industrial buildings, which will be marketed under the trade name of "Coasteel." These buildings will be sold in five types and in all sizes. They are said to be standard in every unit and to consist of standard columns and trusses, standard length bays, and standard window and monitor sashes. The Pacific Coast Steel Co. will manufacture and fabricate the structural steel units; the Pacific Sheet Steel Corporation will roll the sheets for the side walls and roofs, and the Michel & Pfeffer Iron Works, Tenth and Harrison Streets, San Francisco, will act as the sales agent and distributer. All of the steel used in the construction of Coasteel buildings will be galvanized.

Silver Bay Conference on Human Relations in Industry

For the Ninth Annual Conference on Human Relations in Industry, to be held at Silver Bay on Lake George, N. Y., Aug. 26-29, the final program is now announced. The conference is under the auspices of the industrial department of the Y. M. C. A. and there is a conference committee of 18, among whom are Charles R. Hook, American Rolling Mill Co., Middletown, Ohio; A. L. Humphrey, Westinghouse Air Brake Co., Wilmerding, Pa.; F. J. Kingsbury, Bridgeport Brass Co., Bridgeport, Conn.; J. M. Larkin, Bethlehem Steel Co., Bethlehem, Pa.; S. H. Libby, General Electric Co., Bloomfield, N. J.; William H. Woodin, American Car & Foundry Co., New York. Arthur H. Young, of Industrial Relations Counselors, Inc., New York, is chairman and Fred H. Rindge, Jr., 347 Madison Avenue, New York, is executive secretary. Among the addresses scheduled for the conference are the following:

"A Program for the New Industrial Day," by Mrs. Frank Gilbreth, president Gilbreth, Inc.

"The Philosophy of the Payroll," by Joe Mitchell Chapple, editor *National Magazine*.

"Some of the Tap Roots of Human Relations in Industry," by Ernest T. Trigg, president John Lucas & Co.

"An Experience with Employee Representation," by Harvey G. Ellerd, assistant to vice-president, Armour & Co.

"Cooperation and Progress in Modern Industry," by James A. Emery, general counsel, National Association of Manufacturers.

"Improving Human Relations in the Transportation Industry," by A. J. County, vice-president treasury, accounting departments and corporate work, Pennsylvania Railroad.

"American Industry and International Relations," by P. Whitwell Wilson.

"Labor's Viewpoint," by William Green, president American Federation of Labor.

Charges Southern Hardware Jobbers Fix Prices

WASHINGTON, Aug. 10.—Announcement has been made by the Department of Justice that it has filed suit in the United States District Court at Richmond, Va., against the Southern Hardware Jobbers Association and "many of the leading hardware concerns in fourteen Southern States," charging violations of the anti-trust laws by an alleged price fixing combination in hardware, agricultural implements and supplies. In addition to the defendant association, 132 corporations, seven firms and 31 individuals are named as defendants. It is charged in the petition that "the paramount object of the defendant jobbers is to bring about uniform prices among themselves and among all jobbers selling hardware in the southern section of the United States in their sales of hardware to the retail dealers and to eliminate all competition among such jobbers as to prices."

Will Increase Fabricating Capacity in Los Angeles

LOS ANGELES, Aug. 2.—Construction on a plant will be started immediately by the Union Iron Works, this city, at the intersection of the extension of Slauson Avenue with Compton Avenue and Jaboneria Road. At the present time the Union plant, 5125 South Santa Fe Avenue, has a normal production output of 1200 tons of structural steel a month. The construction program calls for erection of one unit of the new plant, to give a 50 per cent increase in production. Robert Miller, general manager, and J. W. Genuit, manager of methods, toured the East and Middle West, studying plants and methods.

The main structure will be 153 x 450 ft. in plan, with sawtooth roof trusses. A material yard, 120 x 750 ft., served by a 10-ton electric crane on a runway 80 ft. in width, is included in the specifications. The distributing yard, 48 x 750 ft. will be served by a 40-ft. crane, and the 90 x 550 ft. shipping yard will have a similar crane of 90-ft. span.

Machinery Markets and News of the Works

SUMMER LULL NOT SERIOUS

Machine Tool Business Better Than Usual at This Time of Year

Scattered Orders for Single Tools Make a Fair Aggregate—Tool Plants Operating at Fairly High Rate

ALTHOUGH machine tool buying has fallen off in all sections during the last few weeks, it is a general observation that the usual summer lull in buying is less pronounced this year. Machine tool plants are going through the summer at a fairly high rate of production, and some of them are extremely busy.

While orders are mostly for single machines, the aggregate is more than the trade expected, and the volume and character of pending inquiry give promise of greater activity in the early fall. Some business is being delayed because of the absence of executives on vacations.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, has bought quite a number of tools against its regular quarterly list. The Carnegie Steel Co. is expected to place orders soon for machines for its new warehouse and fabricating plant at Houston, Tex.

The Marmon Motor Car Co., Indianapolis, has bought a good many used tools for expansion of manufacturing facilities. A considerable part of its recent list of 104 machines has been closed.

Railroad buying has been fairly good. The Delaware, Lackawanna & Western, the Pere Marquette, the Illinois Central and the Alabama Great Southern have recently bought small lists of tools. The Rock Island will soon issue a new list. The Chicago & North Western is expected to buy this week against recent inquiries.

Boston school authorities have purchased 26 tools for an East Boston school.

New York

NEW YORK, Aug. 10.

THE volume of machine tool buying so far in August has shown no improvement over that of the last two or three weeks of July, when the midsummer lull had become evident. Reports from machine tool plants are decidedly more encouraging than those from selling offices. Many of the plants throughout the country are continuing through the summer with a fairly high rate of production, and as the outlook for fall business is regarded hopefully, it is expected that tool manufacturing will go through the year on a scale uniformly greater than that of recent years. The Brooklyn-Manhattan Transit Co., which some time ago received bids on a large list of tools for car repair shops at Coney Island, has submitted final estimates of cost to the Transit Commission, and the equipment presumably will be purchased as soon as the proper authority has been received from the commission. This is the largest pending project in the East.

The Delaware, Lackawanna & Western has ordered the following equipment: A 90-in. locomotive journal turning lathe, 1500-lb. steam hammer, 4000-lb. steam hammer, four Chambersburg power hammers, one 2-in. forging machine, one 1½-in. vertical shear, one 4-in. pipe machine, one centering machine.

Among other orders placed in the past week were the following: Boston & Maine Railroad, 13-in. motor-driven lathe; Pere Marquette Railroad, 16-in. belt-driven lathe; McClintic-Marshall Co., 16-in. geared-head lathe; an Indian Orchard, Mass., manufacturer, a 16-in. geared-head lathe; a Detroit company, a 10-in. thread milling machine; a Cleveland company, a vertical shaper; a Detroit company, a die sinking machine; a Holyoke, Mass., manufacturer, a centering machine; a Lansing, Mich., company, two die sinking machines.

The Purecold Products of America, Inc., 21 East Fortieth Street, New York, organized to manufacture iceless refrigerating equipment and devices, is arranging for the sale of 75,000 shares of stock, the proceeds to be used largely for plant facilities for mass production. Thomas A. Scott, formerly president Merritt, Chapman & Scott Corporation, is president of the company; Matthews Brown is treasurer and secretary.

The Mack International Motor Truck Corporation, 25 Broadway, New York, and Ontario and Bradford Streets, Albany, N. Y., has awarded a general contract to J. J. Finn & Son, 75 Northern Boulevard, Albany, for its one-story service, repair and garage building at Albany, estimated to cost $200,000 with equipment. Faile & Seelye, 101 Park Avenue, New York, are architects.

The Borough Council, Freeport, L. I., plans the installation of pumping equipment in connection with the drilling of additional wells and other extensions in the municipal water system.

Salvati & LeQuornick, 371 Fulton Street, Brooklyn, architects, have plans for a two-story automobile service, repair and garage building, 125 x 137 ft., to cost about $130,000 with equipment.

The Artcraft Iron Works, Inc., Long Island City, has leased a building on Eleventh Avenue totaling about 10,000 sq. ft. of floor space, for the establishment of a new plant for the manufacture of ornamental iron products.

The Paige-Jewett Corporation, 1751 Broadway, New York, local representative for the Paige-Detroit and Jewett automobiles, has acquired property at Belmont Avenue and Fordham Road, 200 x 200 ft., as a site for a new service, repair and garage building, to cost in excess of $500,000 with equipment.

Fire, July 29, damaged a portion of the machinery and stock at the plant of the Braunstein Brothers Soda Fountain Co., Inc., 195-7 Canal Street, New York, manufacturer of soda fountains and equipment. An official estimate of loss has not been made.

Temlock & Reinbach, New York, operating a roofing and sheet metal works, have removed from 428 West Fifty-second Street to 767 Tenth Avenue, where double amount of floor space is available.

Seelig & Finkelstein, 44 Court Street, Brooklyn, architects, have filed plans for a one-story automobile service, repair and garage building, 110 x 130 ft., at 354-66 Clarkson Avenue, to cost about $125,000 with equipment.

The Kny-Scheerer Corporation, 119 Seventh Avenue, New York, manufacturer of surgical instruments, has bought the former plant of the John H. Mayer Tire Duck Co., at 708-20 Freilinghuysen Avenue, Newark, N. J., for a new works. The property consists of a main three-story mill, 135 x 345 ft., with power house and administration building. On adjoining property secured under purchase, the Kny-Scheerer organization plans the early erection of a new four-story unit to occupy practically the entire site, making a total of 355,000 sq. ft. floor area. The company expects to remove to the new location around the end of the year, and will provide facilities for employment of about 2200 operatives.

The Studebaker Corporation, 1540 Broadway, New York, manufacturer of automobiles with plant at South Bend, Ind., has revised plans in progress for a new three-story service, repair and garage building at Jamaica, L. I., 100 x 210 ft., reported to cost $150,000. The W. S. Ferguson Co., Cleveland, is architect.

The Bell Telephone Laboratories, Inc., 463 West Street, New York, has awarded a contract to William H. Grimes & Son, Parsippany, N. J., for buildings at its proposed radio experimental and testing works on 50-acre tract at Whippany, N. J., recently acquired. The project will include the erection of two 250-ft. steel towers.

The United States Industrial Alcohol Co., 110 East Forty-second Street, New York, has acquired the plant and assets of the New Jersey Alcohol & Chemical Corporation, 400 Doremus Avenue, Newark. The new owner will operate the property through a subsidiary and plans for extensions. The Troy Community Garage Corporation, Troy, N. Y., headed by F. M. Baucus, Troy Auto Club, is said to be arranging to ask bids on general contract about Aug. 15 for its proposed four-story service, repair and garage building, 75 x 100 ft., designed to accommodate 400 cars, estimated to cost $350,000 with equipment. G. Saxton Thompson, 257 Broadway, Troy, is engineer.

Joseph A. Hoegger, Inc., 351 Palisade Avenue, Jersey City, N. J., manufacturer of door fasteners and kindred products, is said to have engaged Lockwood, Greene & Co., 100 East Forty-second Street, New York, architects and engineers, to prepare plans for a new factory.

Officials of the Wilson Oil Corporation, 415 Lexington Avenue, New York, have organized a subsidiary, the Wiloyle Refineries, Inc. The company will have its main plant at Kearny, N. J., taking over an existing oil storage and distributing works. Expansion is planned. W. H. Wilson is vice-president.

The Eastern New Jersey Power & Light Co., Asbury Park, N. J., has awarded a general contract to Dwight P. Robinson & Co., Inc., 125 East Forty-sixth Street, New York, engineer and contractor, for an eleven-story operating and headquarters building on Bangs Avenue, estimated to cost $900,000 with equipment.

Charles P. Gillen, director of parks and public property, City Hall, Newark, has rejected bids recently received for the construction of a new power plant at the rear of the City Hall, 46 x 118 ft., estimated to cost $200,000 with equipment. New bids will soon be asked. The installation will include four 250-hp. boilers, automatic stokers, coal and ash conveyors, overhead coal bunkers, etc. James S. Pigott, 14 Park Place, is architect.

New interests headed by Charles Kulow and Samuel Rednor, Trenton, N. J., have acquired the former tile works on Middlesex Avenue, Metuchen, N. J., and plan for immediate remodeling for the production of floor tile. The company is negotiating for adjoining property and contemplates the early erection of an addition.

The Sayre Steel Construction Co., Inc., 50 Church Street, New York, has been incorporated to engage in the fabrication of structural steel. Preston F. Sayre is president; Walter F. Barker, vice-president and Edward M. Bell, secretary.

The Reliable Machine Co., 400 West Twenty-third Street, New York, has been incorporated and will specialize in the designing and building of machines and instruments and the making of dies, tools, etc. It will also place on the market several articles of its own manufacture to be sold by the hardware and electrical trade. Dariton M. Costick is president and Walter Fallows, secretary.

The Gold Seal Products Co., 250 Park Avenue, New York, recently incorporated with capital stock of 127,500 shares of no par value, is working on a line of electrical refrigeration on which it expects to get into production at an early date. James W. Duff is president.

The Fermot Co., 200 Broadway, New York, has appointed the Rawlplug Co., Inc., 66 West Broadway, New York, sole agent in the United States for the sale of its electric Simbi hammers.

The Oakley Chemical Co., manufacturer of compounds for industrial cleaning, with New York office at 22 Thames Street and factory in the Bush Terminal Building, Brooklyn, has been reorganized with $2,000,000 capital stock and has changed its name to Oakite Products, Inc. The personnel of the company will remain unchanged. The new organization is planning to enlarge the scope of its work.

The Harrison Bolt & Nut Co., Harrison, N. J., will erect a warehouse and office building as an extension to its plant. Plans and specifications are by J. M. Baker, Harrison, architect. The general contract will be awarded about Aug. 30.

Philadelphia

PHILADELPHIA, Aug. 9.

PLANS have been filed by the United Gas Improvement Co., Broad and Arch Streets, Philadelphia, for a one-story pumping plant at 4545 North Front Street.

The Philadelphia & Reading Coal & Iron Co., Reading Terminal, Philadelphia, is said to have plans nearing completion for a new coal breaker at its Alaska colliery, Mount Carmel, Pa., to replace the plant recently destroyed by fire, with loss reported in excess of $100,000.

Gabriel B. Roth, 1629 Chestnut Street, Philadelphia, architect, has plans for a two-story automobile service, repair and garage building, 130 x 130 ft., to cost about $85,000.

The National Airoil Burner Co., Ninth and Thompson Streets, Philadelphia, has acquired property at 1327 Girard Avenue for $38,000 and will use for expansion.

The John J. Nesbitt Co., Inc., Atlantic City, N. J., manufacturer of ventilating equipment and systems, has acquired property at Rhawn Street and the State Road, Philadelphia, for the construction of a new plant for which plans have been drawn. The entire development will cost about $150,000 with equipment.

Revised plans are being prepared by Irwin T. Catharine, Franklin Trust Building, Philadelphia, architect, for a four-story automobile service, repair and garage building, 97 x 100 ft., to cost $150,000 with equipment.

The Star Sprinkler Corporation, 3239 Market Street, Philadelphia, has recently acquired property at Collins and Westmoreland Streets and is said to be arranging to remodel for a new plant.

The Penn Metal Co., Twenty-fifth and Wharton Streets, Philadelphia, manufacturer of metal ceilings, roofing, etc., has acquired property heretofore occupied under lease at location noted, and plans expansion. A permit has been taken out for alterations and improvements in existing building.

Frank Rieder & Sons, 343 North Fourth Street, Philadelphia, manufacturers of store and office fixtures, have acquired a five-story factory at Brown and Lawrence Streets, on site, 108 x 120 ft., and will remodel for a new plant. About $102,000 was given for the property.

The National Building Units Corporation, Philadelphia, recently formed to take over and consolidate eighteen plants in different parts of the country devoted to concrete block production, will maintain headquarters in this city. Arrangements are being made for the sale of 25,000 shares of preferred stock and 350,000 shares of common stock, no par value, the proceeds to be used to carry out the merger and for proposed expansion. Interests in this section identified with the new organization include the Philadelphia Partition & Building Block Co., Real Estate Trust Building; Concrete Specialties Co., Camden, N. J.; Lancaster Concrete Tile Co., Lancaster, Pa.; Harrisburg Building Block Co., and the Pennsylvania Concrete Roofing Tile & Cement Products Co., both of Harrisburg, Pa. L. A. Goodwin, Camden, is president; George L. Benbow, Philadelphia, vice-president; and H. P. Griffith, Philadelphia, treasurer.

The E. F. Griffiths Co., 1421 McFerran Street, Philadelphia, manufacturer of meters, registers, etc., has acquired a two-story factory at 346 East Walnut Lane, totaling about 25,000 sq. ft. of floor area, for $50,000 and will use for expansion.

The Sharples Specialty Co., Twenty-third and Westmoreland Streets, Philadelphia, manufacturer of centrifugal equipment, has taken out a permit for a one-story shop addition.

Lloyd Titus, Brighton Hotel, Atlantic City, N. J., architect, has plans for a three-story automobile service, repair and garage building, 70 x 135 ft., on New York Avenue, to cost $130,000 with equipment.

D. Manson Sutherland, Jr., Broad Street Bank Building, Trenton, N. J., consulting engineer, has acquired for a company, name temporarily withheld, the former plant of the Panelyte Board Co., Whitehead Road, manufacturer of wallboard. The new owner will soon take possession and plans resumption of production for a similar line of manufacture.

Warren Balderston & Co., Greenwood Avenue and Jackson Street, Trenton, N. J., manufacturer of heating and plumbing equipment, etc., has arranged for an increase in capital stock, a portion of the proceeds to be used for reorganization and expansion. It has also filed notice of change of name to the Warren Balderston Co. William A. Warren is president, and George A. Balderston, secretary.

The Board of Education, 123 South Sixth Street, Darby, Pa., plans the installation of manual training equipment in

The Crane Market

INQUIRIES for electric overhead cranes have been rather light this week, and there is little likelihood that the companies which will come into the market in August will buy before the first of September. Inquiries continue to come out for locomotive cranes, but there is little promise of much buying in the very near future. The order for 24 electric cranes for the New York Rapid Transit Corporation, which is reported to have been recommended to be placed with Alfred Box & Co., has not yet been closed.

In the Pittsburgh district inquiry for cranes is fairly good, but few awards have been made. The Duquesne Light Co. will close soon for a 30-ton electric overhead crane. The Carnegie Steel Co. is inquiring for eight cranes for its new warehouse at Houston, Tex., and for a gantry crane for its dock at Baton Rouge, La.

Among recent purchases are:

Dixie Wood Pulp Co., Tennille, Ga., a used 20-ton, 50-ft. boom Brownhoist locomotive crane, and T. Scgretto, Bayonne, N. J., a used 10-ton, 40-ft. boom, gasoline operated caterpillar crane, both from Phillip T. King.

International Harvester Co., Moline, Ill., a four motor gantry crane from the Milwaukee Electric Crane & Mfg. Corporation.

American Seating Co., Grand Rapids, Mich., a 2-ton, 27-ft. span electric traveling crane from the Shepard Crane & Hoist Co.

Timken Roller Bearing Co., Canton, Ohio, a 15-ton and a 50-ton standard crane, one 165-ton ladle crane and a combination stripping and charge machine; Phoenix Iron Co., Phoenixville, Pa., a 20-ton special type crane; International Cement Corporation, New York, an 8-ton special type crane; Central Furnace Co., Massillon, Ohio, a 10-ton standard crane; Bethlehem Steel Co., Bethlehem, Pa., a 10-ton special type crane, two 15-ton standard, a 20-ton standard and a 40-ton standard crane; Colorado Fuel & Iron Co., Pueblo, Colo., two 20-ton double trolley cranes and a 20-ton standard crane; Tennessee Coal, Iron & Railroad Co., Birmingham, a 50-ton standard crane; Bourne-Fuller Co., Cleveland, one 175-ton ladle crane; Youngstown Sheet & Tube Co., Youngstown, a 10-ton standard crane; McKinney Steel Co., Cleveland, a 5-ton and a 10-ton standard crane; Philadelphia Rubber Co., Philadelphia, one 1½-ton standard crane and a 2-ton gantry crane, all from the Alliance Machine Co., Alliance, Ohio.

its proposed two-story and basement high school at Seventh and Spruce Streets, for which Ritter & Shay, Fifth and Chestnut Streets, Philadelphia, architects, will prepare plans. It is estimated to cost $200,000.

The Coplay Cement Mfg. Co., Coplay, Pa., has work in progress on an expansion program to cost about $750,000, including the installation of additional grinding equipment, electrical apparatus and other machinery.

The Allentown Steel Products Co., 520 Linden Street, Allentown, Pa., manufacturer of all-steel garages, etc., is said to be considering extensions for increase in present capacity, to include the removal of the works to a larger building.

The Lehigh Valley Ice Co., Peach and American Streets, Catasauqua, Pa., is arranging for addition to its plant and the installation of machinery to increase the output to 55 tons per day.

Fire, Aug. 2, destroyed a portion of the plant of the Watsontown Fertilizer Co., Watsontown, Pa., with loss reported at $25,000 including equipment. It is planned to rebuild.

New England

BOSTON, Aug. 9.

MACHINE tool business fell off the first week in August partly as a result of numerous plants being closed on account of vacations, and others being forced to close some days on account of the excessive heat. The market is by no means dull, however. Some sales of new tools reported include four 24-in. lathes, a planer, a shaper and a milling machine to a plant near Boston; a 24-in. shaper and a Milwaukee milling machine, a power press, centering machine, a large lathe, two 20-in. lathes and a 16-in. lathe to other Massachusetts companies.

The used machinery market is comparatively quiet. The Atlantic Works, East Boston is combing the market for motor-driven tools and is reported to have placed some orders in New York and Philadelphia. It is reported also that the company has abandoned its plan to buy new machine tools. Four used milling machines and a 36-in. used planer were sold by a local house to a Pittsburgh machinery maker, and about a dozen miscellaneous tools to as many New England shops.

The Boston Board of Education has closed on 26 machines for an East Boston school, bids for which closed last month. Henry Prentiss & Co. will furnish four tools; Manning, Maxwell & Moore, Inc, six; Hill, Clarke & Co., three; Joseph Beal & Co., three, and the Brown & Sharpe Mfg. Co., six, most of which were milling machines and tool grinders.

The Worcester, Mass., business review for August, issued by the Worcester Bank & Trust Co., refers to the fact that with a few establishments in that city business is dull, but many companies are having a good average operation, while others, including the Worcester works of the American Steel & Wire Co. and the Norton Co., are on an unusually prosperous basis. For several months, the three plants of the American Steel & Wire Co. have been shipping at a greater rate than at any previous time since the war. Business in sight indicates the continuance of this scale of operations at least through November. Outbound railroad-car loadings in Worcester in June were 24,888 tons, which was 3 per cent less than the May figure but an increase of 3 per cent over June, 1925. Manufactured products make up over 90 per cent of the tonnage.

The United Electric Light Co., Springfield, Mass., has tentative plans for a new generating plant to cost with equipment $1,000,000. One or more cranes will be required. Walter L. Mulligan is treasurer.

The Hartford Special Machine Co., 287 Homestead Avenue, Hartford, Conn., has awarded contract to Fred T. Ley Co., Springfield, for a one-story addition, to cost $10,000 without equipment.

The Massachusetts Gear & Tool Co., 30 Nashua Street, Woburn, Mass., is taking bids for a proposed one- and two-story, 72 x 79 ft., manufacturing plant. E. Lyman is treasurer.

Work will start at once on a one-story machine shop at 150 Medford Street, Somerville, Mass., for the Cambridge Machine & Tool Co., 234 Washington Street, that city. Plans are private.

The J. W. Greer Co., Windsor Street, Cambridge, Mass., candy-cooling apparatus has awarded contract for a two-story and basement, 60 x 63 ft., addition. H. E. Richards, 7 Water Street, Boston, is the engineer.

The Narragansett Electric Light Co., Providence, R. I., has awarded contract for the erection of a transformer repair shop. Jenks & Ballou, 1035 Grosvenor Building, Providence, are the engineers.

The Chapman Valve Mfg. Co., Springfield, Mass., has awarded contract for a two-story and basement, 60 x 100 ft. electric service and maintenance unit. Electric service for the entire plant will be furnished from this unit, and the masonry, carpentry, steamfitting, pattern and other departments will be housed there. Smith & Annable, 121 Lyman Street, Springfield, are the architects.

E. W. Pierce & Chesworth, Inc., Travers Street, Gardner, Mass., machinery, has under consideration the erection of a new plant. The architect will be selected shortly.

Plans have been completed for a one-story, 30 x 100 ft., manufacturing plant on Lowell and Vernon Streets, Wakefield, Mass., for the Wakefield Garage Mfg. Co. Plans are private. Thomas J. Quinn is proprietor.

The Wickwire Spencer Steel Corporation, Worcester, Mass., has sold three brick plants containing approximately 73,000 ft. of manufacturing space, formerly used for the manufacture of wire goods and specialties, to the Morgan Construction Co., of that city.

The amalgamation of Walden-Worcester, Inc., Worcester, Mass., and Stevens & Co., New York, under the new name of Stevens Walden-Worcester, Inc., became effective Aug. 1. For the present each company, while using the new name, will place its orders separately and will make separate payment for its respective purchases. Until it is possible to complete the movement of their inventory to Worcester,

Stevens & Co. will continue to operate from their New York address.

Frans H. C. Coppus has resigned as president and treasurer of the Coppus Engineering Corporation, Worcester, Mass., to devote most of his time to the manufacture of railroad equipment under the name of the Coppus Locomotive Equipment Co. The Coppus Engineering Corporation has assigned to Mr. Coppus its rights and interests in the Coppus Locoblow, which is for drafting locomotives in roundhouses. Mr. Coppus will be identified with the Coppus Engineering Corporation in a consulting capacity and as chairman of the board, retaining also his financial interest in the corporation. Otto Wechsberg, formerly general manager of the Coppus Engineering Corporation, is now president and general manager and Jerome R. George, Jr., is treasurer.

The Hartford Empire Co., 347 Homestead Avenue, Hartford, Conn., manufacturer of glass machinery, has awarded a general contract to the Lawrence & Coe Construction Co., 43 Farmington Avenue, for its three-story addition, 53 x 90 ft., to cost about $60,000 including equipment. Buck & Sheldon, Inc., Hartford, is architect and engineer.

Fire, Aug. 1, destroyed a portion of the veneer mill at the box-manufacturing plant of the Sprague & Reynolds Co., Main Street, Norton, Mass., with loss reported at $17,000 including equipment. It is planned to rebuild.

The Harper Knife Blade Co., Hemingway Street, Winchester, Mass., is arranging for the early removal of its plant to a leased building at Stoneham, Mass., where it is proposed to increase capacity.

Fire, Aug. 1, destroyed a portion of the canning plant of the Seacoast Canning Co., Eastport, Me., known as factory No. 7, with loss estimated at $100,000 including equipment. Tentative plans are under way for rebuilding.

The Beacon Oil Co., 111 Devonshire Street, Boston, has plans under way for a three-story addition to its storage and distributing plant at Everett, Mass., 40 x 115 ft., estimated to cost $65,000.

Miller & Levi, 46 Cornhill Street, Boston, architects, have completed plans for a one-story automobile service, repair and garage building on Main Street, Cambridge, Mass., to cost $115,000 with equipment.

Following the resignation of Ralph K. Mason as president of the Trumbull-Vanderpoel Electric Mfg. Co., Inc., Bantam, Conn., and the sale of his interest in the company, plans are under way for reorganization and expansion. A preferred stock issue of $350,000 will soon be sold to carry out the change. Consideration is being given to the removal of the majority of the works to Torrington, Conn. The company will continue to manufacture electrical switches and kindred apparatus. Harmon J. Cook has been elected president; John H. Lancaster, vice-president, and B. Russell Leavitt, secretary and treasurer.

Fire, Aug. 4, destroyed a portion of the plant of the Hoosac Valley Lime Co., Howland Avenue, Zylonite, near Adams, Mass., with loss reported at $16,000. The building was of frame, and it is purposed to replace with a steel structure. William H. Flaherty is president.

The Broad Street Automobile Co., New London, Conn., is having plans drawn for a one-story service, repair and garage building, 120 x 170 ft., to cost approximately $100,000 with equipment. F. DeGange, 60 Ocean Avenue, is architect.

The United Electric Light Co., Springfield, Mass., has preliminary plans for a new steam-operated electric generating plant in the vicinity of its present station, estimated to cost $1,000,000 with machinery. The Stone & Webster Engineering Co., 147 Milk Street, Boston, is engineer. Walter K. Mulligan is treasurer.

Detroit

DETROIT, Aug. 9.

CONTRACT has been let by the Sears Paper Co., Lynne and Magra Streets, Saginaw, Mich., without competition to the H. G. Christman Co., South Bend, Ind., for a six-story and basement addition, 120 x 300 ft., to cost $300,000 with equipment. C. W. and G. L. Rapp, 190 North State Street, Chicago, are architects.

The H. J. Grigoleit Co., formerly of Chicago, has begun operations in a portion of the plant of the Jackson Motor Co., South Horton Street, Jackson, Mich., specializing in the manufacture of hydraulic presses, including press equipment for the molding of rubber and kindred products. It is expected to advance the present production schedule soon, with an increase in the working force to about 200.

L. D. Goddeyne, Bay City, Mich., operating a metal plating works, plans the erection of a one-story addition to cost $17,000 with equipment.

The Board of Education, Hamtramck, Mich., is considering the installation of manual training equipment in its proposed junior high school, estimated to cost $600,000, for which plans will be prepared by B. C. Wetzel & Co., Dime Bank Building, Detroit, architects.

Work has begun on the new plant of the Continental Tool Works, 5435 McGraw Avenue, Detroit, to be one-story, 110 x 260 ft., estimated to cost $150,000. It will be equipped for the manufacture of special tools, milling cutters, counterbores, etc. S. F. Wall is president of the Continental company, and T. M. Olsen, secretary and general manager.

The Luce Furniture Co., Grand Rapids, Mich., has awarded a general contract to the Palmer Construction Co., Grand Rapids Savings Bank Building, for a six-story addition at 655 South Godfrey Avenue, 125 x 300 ft., to cost in excess of $750,000 with machinery. M. J. Dregge is president.

The Detroit Lubricator Co., 5842 Trumbull Avenue, Detroit, manufacturer of lubricating devices and systems, is completing plans for a two-story addition, 55 x 110 ft., to cost $50,000 with equipment. R. O. Derrick, Inc., 120 Madison Avenue, is architect and engineer. C. H. Hodges is president.

The Electric Refrigeration Corporation, Detroit, comprising a merger of the Kelvinator Co. and the Nizer Corporation, manufacturer of electric refrigerators and refrigerating equipment, has authorized plans for the initial unit of its proposed plant on site on Plymouth Road, totaling 38 acres, recently acquired. The structure will be three stories, 440 x 640 ft., with parts and assembling departments for all branches of manufacture for complete refrigerating units. It is purposed to consolidate the present works of the Kelvinator and Nizer divisions at this location. The plant will be completed early in 1927 and is estimated to cost close to $2,000,000. A. H. Goss is president.

The Adrian Wire Fence Co., Adrian, Mich., has taken over the business of the Michigan Wire Fence Co., also of Adrian, including the rights, patterns and inventory of the latter company's stretcher business. The sales organization of the Adrian company will take over sales of both companies and the manufacture of fence by the Michigan Wire Fence Co. will be discontinued.

Indiana

INDIANAPOLIS, Aug. 9.

PLANS are being considered by the Sperry Mfg. Co., New Haven, Ind., manufacturer of wood handles and other turned wood products, for rebuilding its one-story plant, 75 x 150 ft., recently destroyed by fire. The reconstruction will cost approximately $75,000 with machinery. F. E. Smith is president.

The Tarpenning-Lafollette Co., 1020 Canal Street, Indianapolis, manufacturer of ventilating equipment, sheet metal products, etc., has acquired a building at Tenth Street and the canal, with total floor area of 15,000 sq. ft., a portion of which is under lease to the Western Machine Co. The unoccupied portion will be used by the purchasing company for the manufacture of standard parts and certain sheet metal specialties. B. E. Lafollette is one of the heads of the company.

Morrison & Risman, Inc., 1437 Bailey Avenue, Buffalo, scrap iron and metal etc., will proceed by day labor with the erection of its one-story branch plant, 40 x 115 ft., at Turner and Addison Streets, Indianapolis, to cost about $36,000 with equipment.

The Indianapolis Street Railway Co., Indianapolis, has applied for permission to construct and operate six new automatic power substations in different portions of the city. The plants are estimated to cost close to $350,000, and authority has likewise been requested for a note issue in this amount, the proceeds to be used for the stations. Robert I. Todd is president.

The Carle Machinery Co., Detroit, recently organized, is completing negotiations for the purchase of the former plant of the Imperial Drop Forge Co., 510 South Harding Street, Indianapolis, now held by the bondholders of that organization. The Carle company will remodel the works, installing equipment for the manufacture and rebuilding of metal-working machinery. The new company is capitalized at $100,000 and is headed by Amos E. Carle and George R. Shuman, both of Detroit; Burrell Wright and W. J. Holliday, both of Indianapolis.

Bids will soon be asked by the Union Furniture Co., Batesville, Ind., for the erection of a four-story addition, 32 x 117 ft., estimated to cost $75,000 with equipment. Martin Fisher, Brighton Bank Building, Cincinnati, is architect.

The Northern Indiana Public Service Co., Hammond, Ind., affiliated with the Northern Indiana Gas & Electric Co., has applied for permission to issue securities in amount of $16,-

500,000, a portion of the proceeds to be used for extensions and improvements. The companies are operated by Samuel Insull, head of the Commonwealth Edison Co., 72 West Adams Street, Chicago, and associates.

E. F. Miller, Farmers' Trust Building, Anderson, Ind., architect, has filed plans for a three-story automobile service, repair and garage building, 70 x 145 ft., to cost about $85,000 including equipment.

The Gary Heat, Light & Water Co., Gary, Ind., will soon begin superstructure for its proposed three-story and basement shop, equipment storage and distributing building, estimated to cost $200,000, for which a general contract was recently let to Williams & Patch, 457 Broadway.

The Enterprise Iron & Wire Fence Co., Indianapolis, has been organized with capital stock of 1,000 shares of no par value to manufacture ornamental iron products. L. R. Ford is manager.

Chicago

CHICAGO, Aug. 9.

THERE has been less activity the past week in the machine tool market, but with inquiry in fair volume dealers are of the opinion that August will prove to be a good month from the standpoint of sales. The Illinois Central placed an order for a 30-in. x 18-ft. lathe for its Paducah, Ky., shop and bought a 13-in. x 6-ft. lathe, a 42-in. drill and two 36-in. drills for another shop. The Burlington is in the market for some wood-working machinery and has practically closed on its recent machine tool list. The Rock Island will soon issue a new list, and the trade expects a large portion of the North Western inquiries to be closed this week. Sales of used machinery are in fair volume, and prices obtained are good, particularly on the better class of equipment.

The Acme Steel Co., 112 West Adams Street, Chicago, will build a warehouse, 100 x 500 ft. at its Riverdale, Ill., plant. An overhead electric traveling crane, levelers, automatic cut to length machinery, slitting and edging machinery, pickling and oiling equipment will be installed for the purpose of further preparing the product of its new 20-in. hot strip mill.

The City Council, Duluth, Minn., is reported as planning the rebuilding of its electric power station and water plant at West Duluth, recently damaged by fire. A. H. Davenport is city clerk.

C. Reutcher, 3935 North Spaulding Avenue, Chicago, will build a one-story brick machine shop, 34 x 65 ft., to cost $8,000. E. N. Braucher, 10 North Clark Street, is architect.

The Liquid Carbonic Corporation, Chicago, has been organized to take over and expand the Liquid Carbonic Co., manufacturer of soda fountain equipment and supplies, with local plant at 3100 South Kedzie Avenue. A bond issue of $4,000,000 is being sold, the proceeds to be used for the acquisition and proposed expansion. W. K. McIntosh is president.

The Star Paper Co., 450 North Hermitage Avenue, Chicago, has plans for a three-story and basement addition, 72 x 110 ft., including improvements in the present factory at 1734-38 West Austin Avenue, to cost close to $45,000. M. L. Bein, 64 West Randolph Street, is architect. Abraham Jaffe is president.

The City Ice Co., Cedar Rapids, Iowa, is arranging for the erection of a new ice-manufacturing plant to cost about $50,000 with equipment. It is expected to begin work in the fall.

The Chuse Engine Co., Mattoon, Ill., is said to be contemplating a one-story addition and will have plans drawn soon. George Chuse is general manager.

The Monarch Mfg. Co., Council Bluffs, Iowa, manufacturer of oil products, is considering rebuilding the portion of its plant destroyed by fire July 29, with loss reported in excess of $450,000, including equipment.

The Evanston Garage Building Corporation, Evanston, Ill., care of the Realty Investment Co., 10 South La Salle Street, Chicago, has plans for a three-story and basement service, repair and garage building, 90 x 210 ft., Evanston, estimated to cost $425,000 with equipment. Maurice L. Bein, 64 West Randolph Street, Chicago, is architect. Jacob Hoffman is president.

The Great Western Sugar Co., Sugar Building, Denver, Colo., is reported to have plans for a proposed beet sugar refinery near Lyman, Neb., to cost in excess of $850,000 with machinery. This will make the 21st refinery of the company.

The Board of Works, Council Bluffs, Iowa, has plans under way for the installation of new pumping equipment for the municipal water system. Arthur L. Mullergren, Board of Trade Building, Kansas City, Mo., is engineer.

The Northwest Paper Co., Cloquet, Minn., has begun the construction of a new plant, consisting of a main two-story building 100 x 190 ft., and three-story office structure, 50 x 70 ft., estimated to cost $100,000. The Jacobson Engineering Co., 430 Oak Grove Avenue, Minneapolis, Minn., is engineer. R. M. Weyerhauser is president.

The Midwest Foundry Co., 257 South Chambers Street, Galesburg, Ill., has work under way on rebuilding its one-story foundry, 50 x 50 ft. and 30 x 70 ft., occupied under lease, recently destroyed by fire. It is estimated to cost close to $40,000.

The Montana Power Co., Butte, Mont., is planning the construction of an electric power station for light and power service at Glasgow, Mont., estimated to cost $125,000 including power lines.

Ohio

CINCINNATI, Aug. 9.

WITH a number of local builders reporting the receipt of a sizable volume of orders the past week, the machine tool market is showing signs of strength. Although no outstanding sales have been made, bookings of single machines, taken in the aggregate, have been above normal for the midsummer season. Of particular interest has been the demand for planers. Cincinnati plants are not operating on as heavy a schedule as a few months ago, but nevertheless are maintaining a moderate rate of production.

The Marmon Motor Car Co., Indianapolis, has closed against a considerable portion of its list of 104 tools. Used machinery has constituted the bulk of its purchases. The Pere Marquette Railroad bought two 53-in. boring mills and a 5-ft. plain right-line radial drill. The Alabama Great Southern Railway, which took several tools a week ago, has added a 90-in. driving-wheel lathe. The Whiting Corporation, Harvey, Ill., purchased a 7-in. spindle floor borer, and the McClintic-Marshall Co. bought a 1100-lb. single-frame steam hammer. The Cleveland Planer Co. sold a 30-in. planer to the Koestlin Tool & Die Co.

Sales of used tools have been fairly good the past month. The Triumph Electric Co., Cincinnati, will offer approximately 50 to 60 tools at auction this week.

The Roether Foundry Co., Dayton, Ohio, has leased the former forge shop of the Barney & Smith Car Co. with a floor area of 85,000 sq. ft. The new quarters will provide more space for the company's growing business. Charles C. Roether is president.

The Triumph Electric Corporation, which recently succeeded to the business of the Triumph Electric Co., Cincinnati, has leased a one-story plant in Carthage, a suburb of Cincinnati, and is moving the equipment purchased from the latter company to that plant. The new company also owns and operates the Triumph Ice Machine Co.

The Fishel & Marks Co., foot of Krakow Avenue, Cleveland, which has been engaged for some time in buying and selling iron and steel scrap, has been dissolved. A. Shaw is chairman of the committee of liquidating trustees. J. R. Fishel has organized the J. R. Fishel Steel Co. and J. D. Marks is operating under his own name, both continuing in the scrap business in Cleveland.

The Logangear Products Co., Toledo, Ohio, has been incorporated and has succeeded to the business of the Kauffman Metal Products Co. It has an authorized capital of $140,000 preferred stock and 6000 shares of common stock of no par value. The new company has a completely equipped plant on the Terminal Railroad for the manufacture of steel starter gears and automobile rims, felloe bands and other automobile parts. C. O. Miniger is chairman of the board and J. B. Nordholt is president.

The Spayd Brothers Foundry & Machine Co., Van Wert, Ohio, has been incorporated with capital stock of $200,000 to manufacture machinery, principally a new stave jointer for slack and tight barrel staves, barrel headers, etc. It is building a factory and has purchased necessary equipment.

Tentative plans are being considered by the Parker Airplane Co., Anderson, Ind., for a new two-story assembling plant at Dayton, Ohio, 150 x 200 ft., to cost about $80,000 with equipment.

Fire, Aug. 4, destroyed a portion of the plant of the Holtzman & Sons Piano Seat Co., Columbus, Ohio, with loss reported at $50,000 including equipment. It is planned to rebuild.

The Shartle Machine Co., 359 Dublin Avenue, Columbus, Ohio, has inquiries out for a locomotive crane, 8-wheel type, 45-ft. boom, about 20 tons capacity.

The Board of Education, North Baltimore, Ohio, plans the installation of manual training equipment in its proposed two-story and basement high school to replace a structure recently destroyed by fire, estimated to cost $250,000. Walker & Norwick, American Building, Dayton, Ohio, are architects.

The City Hall Garage, 106 Barr Street, Lexington, Ky., has been making inquiries for a drill press.

The Big Run Coal & Clay Co., Ashland, Ky., has work under way on a new plant for the manufacture of hollow tile, to cost about $75,000 with equipment. C. A. Coleman is president.

The Southern Railway Co., 1300 Pennsylvania Avenue, Washington, has awarded a general contract to Dwight P. Robinson & Co., 125 East Forty-sixth Street, New York, for its proposed shops and terminal at Chattanooga, Tenn., comprising engine house, machine shops, blacksmith and forge shop, boiler works, tank shop, power house and other structures, to cost in excess of $500,000 including equipment.

The Illuminating Shop, Cincinnati, manufacturer of lighting fixtures and equipment, has removed its works from 828 Main Street to 220 East Third Street, where additional facilities will be provided for increase in output. N. A. Bell and Frank O. Ayler are heads.

The Memphis National Garages, Inc., Memphis, Tenn., care of Marr & Hollman, Stahlman Building, architects, has tentative plans for a proposed service, repair and garage building at Front Street and Court Avenue, estimated to cost $750,000. The company is affiliated with the National Garages, Inc., Detroit.

The Crystal Tissue Co., Middletown, Ohio, is said to have preliminary plans under way for a new paper mill, to cost in excess of $80,000 with equipment. Z. E. Ranck is president.

The L. J. Breed Equipment Co., James Building, Chattanooga, Tenn., has inquiries out for an electrically operated channeling machine for a marble quarry, Sullivan type preferred, steam-operated machine will also be considered; also for two 3-drum hoists, and one swinging attachment hoist for 50-ton derrick; and one air compressor, 2200 cu. ft. capacity, electrically driven, Ingersoll-Rand or similar type.

The Atlas Rock & Asphalt Co., Inc., Russellville, Ky., care of Peter B. Young, St. Joseph, Mo., president, has plans under way for a new quarry in the vicinity of Russellville, to be equipped for a capacity of about 1000 tons per day. It will take over the former Mason mines and other properties in this district.

Buffalo

BUFFALO, Aug. 10.

NEGOTIATIONS have been concluded by Thomas F. Maher and Irven A. Button, both of Jamestown, N. Y., for the purchase of the property and assets of the Jamestown Iron Works Co., Shearman Place, heretofore operated by Emil Froding and Charles M. Nichols. The new owners will continue the plant in service and will likely arrange for improvements in the near future. Mr. Button has been connected with the iron works for several years, and Mr. Maher is head of the machine works run in the name of Patrick Maher at 20 Taylor Street. The last noted plant will be maintained in operation as heretofore.

The Buffalo Cold Storage Co., 101 Columbia Street, Buffalo, has completed plans for extensions and improvements in its four-story plant at location noted, estimated to cost $30,000. Plumer & Mann, 700 Main Street, are architects.

Samuel C. Rogers & Co., 10 Lock Street, Buffalo, manufacturers of knife grinders and kindred products, have filed plans for a new one-story plant at 201 Dutton Street, to cost about $21,000.

Fire, Aug. 1, destroyed a portion of the plant of the Nehrbass Rendering Works, William Street, Cheektowaga, near Buffalo, manufacturer of fertilizers and kindred products, with loss reported at $25,000 including equipment. Plans are said to be under advisement for rebuilding.

The Binghamton Gas Works, Chenango Street, Binghamton, N. Y., has revised plans for a two-story service and mechanical repair building, 60 x 145 ft., to cost about $75,000 with equipment. Conrad & Cummings, Phelps Building, are architects. C. E. Bennett is general manager.

William H. Barr, Buffalo, formerly president National Founders' Association, and associates have organized the William H. Barr, Inc., to specialize in the production of brass and bronze castings for automobiles. The company has completed negotiations with the Buffalo Pitts Co., 27 Carolina Street, to operate at that works, and purposes to begin production early in the fall. Facilities will be provided for an annual output of about 2500 tons. Mr. Barr will be president of the new concern.

The Binghamton Light, Heat & Power Co., Binghamton, N. Y., affiliated with the Metropolitan Edison Co., Reading, Pa., is said to have plans for a new steam-operated electric generating plant to cost in excess of $150,000, with equipment. Both organizations are operated by the General Gas & Electric Co., 50 Pine Street, New York.

The Richardson Corporation, 1069 Lyell Avenue, Rochester, N. Y., manufacturer of soda fountain equipment and supplies, has awarded a general contract to the Alexander, Shumway, Utz Co., 80 South Fitzhugh Street, for a one-story addition, 80 x 125 ft., to cost about $70,000 with equipment. J. F. Ancona, 42 East Avenue, is architect.

The American Can Co. will build an addition to its plant at Geneva, N. Y., containing 35,000 sq. ft. of floor space. It will cost about $150,000. John J. O'Malley is local manager.

Milwaukee

MILWAUKEE, Aug. 8.

A MORE active local market for machine-tools is developing following the resumption of foundry and machine shop construction after a period of several months during which industries were inclined to mark time. The new construction so far is of extensions to existing plants, although there are signs which indicate erection of new works. Tool trade so far in August has been better than usual for the period, and manufacturers continue to book at least as many orders as they are shipping.

W. W. Oeflein, Inc., 86 Michigan Street, Milwaukee, has been awarded the general contract for a one-story brick and steel extension, 150 x 602 ft., to the joint plants of the Chevrolet Motor Co. and Fisher Body Corporation at Janesville, Wis. Ellery L. Wright is plant manager at Janesville.

The Filer & Stowell Co., 219 Becher Street, Milwaukee, manufacturer of sawmill machinery, engines, conveyors, hoists, etc., has let the general contract to the Worden-Allen Co., Milwaukee, for alterations and enlargements, the principal improvement being a one-story machine shop and assembling-floor addition, 100 ft. sq. J. L. Monaghan is president and general manager.

The Hewitt Machine Co., Neenah, Wis., has started work on a shop addition to accommodate the tools and equipment of the Menasha Machine Co., which it has acquired from J. F. Hawley and Kai Schubert. Mr. Hawley will engage in business in Chicago, while Mr. Schubert becomes associated with the Hewitt company, which is to be incorporated shortly. John W. Hewitt is general manager.

Julius W. Zier, 116 Sixth Street, Watertown, Wis., is establishing an aluminum, brass and white metal foundry in his shop building, used for three years mainly for manufacturing concrete burial vaults. Mr. Zier for many years was superintendent of the foundry of the Brandt-Dent Co., Watertown, manufacturer of automatic coin machines, registers and counting machines.

The J. Ruesch Printing Machinery Co., 495 Broadway, Milwaukee, has postponed until next spring the proposed erection of a new plant and service building, 30 x 120 ft., three stories and basement. Plans are by William J. Kozick, 664 Twenty-sixth Street, local.

The A. F. Gallun & Sons Co., 1000 North Water Street, Milwaukee, tanner and leather manufacturer, has plans for a one-story machine and service shop, 120 x 88 x 120 ft., to cost about $75,000 complete. Work is to begin immediately. Albert F. Gallun, Jr., is general manager.

The Milwaukee Department of Public Works, R. E. Stoelting, commissioner, is asking bids until Aug. 27 for furnishing and installing one 400-hp. horizontal water-tube boiler, together with furnace, mechanical stoker, superheater, forced-draft apparatus, etc., for the enlarged North Point pumping station, foot of North Avenue. Joseph Schwada is city engineer.

The American Electric Motors, Inc., 57 Erie Street, Milwaukee, has plans for a new manufacturing unit of 30,000 sq. ft., at Cedarburg, Wis., at a cost of about $50,000 complete. Paul E. Keller is vice-president and chief engineer.

Bauer & Kohler, West Bend, Wis., have plans by J. E. Hennen, architect, Fond du Lac, Wis., for a $40,000 automotive headquarters building, with about 4000 sq. ft. of shop space. Bids will be taken about Aug. 25.

The Randco Co., 466 Oakland Avenue, Milwaukee, has awarded the general contract to R. L. Reisinger & Co., local, for the construction of a seven-story manufacturing and of-

fice building, 118 x 122 ft., at Mason and Van Buren Streets. The principal tenant will be the Meyer-Rotier-Tate Printing Co., a recent consolidation of several large printing and publishing firms of Milwaukee, which plan changes and additions to equipment when the physical properties are merged upon the completion of the new building. Elmer L. Arnold, 137 Second Street, is president and general manager.

The Village Board, West Milwaukee, Wis., has engaged Martin Tuligren & Sons, Inc., architect, 9 Waverly Place, Milwaukee, to design a new $200,000 high and vocational school, construction of which is to begin in September. Percy E. Kamlah, 471 Forty-third Avenue, is president of the board.

Edward A. Juul, architect, Sheboygan, Wis., is working on plans for a client whose identity is withheld for the present, but known to be in the furniture manufacturing industry, for a four-story factory addition, 104 x 200 ft., and a dry room, 100 x 120 ft., to cost about $200,000 complete. Bids will be taken late in August.

The Village Board, Gillett, Wis., is asking bids until Aug. 19 for a 500-gal. pumping unit, complete with motor, and a 100,000-gal. steel tank mounted on a steel tower. The engineers are McMahon & Clark, Menasha, Wis. Peter Nygaard is village clerk.

The Wisconsin Power & Light Co., 16 North Carroll Street, Madison, Wis., has awarded the general contract to J. P. Cullen & Co., 109 South Main Street, Janesville, Wis., for the reconstruction and enlargement of the central hydroelectric generating plant on the Rock River at Janesville, to cost about $125,000. Two new turbine wheels are the principal items of new equipment. E. J. Kallevang, Madison, is chief engineer.

The Board of Education, New Richmond, Wis., will spend about $100,000 in rebuilding and enlarging the high and vocational training school, damaged by fire several weeks ago. The general contract has been placed with Hoeppner & Bartlett, Eau Claire, Wis. The architects are Parkinson & Dockendorff, LaCrosse, Wis. A. Deneen is secretary of the board.

St. Louis

ST. LOUIS, Aug. 9.

BIDS have been asked by the Century Electric Co., 1806 Pine Street, St. Louis, manufacturer of motors, fans, etc., for a two-story top addition, 85 x 130 ft., to its three-story works. Klipstein & Rathman, Security Trust Building, are architects. E. S. Pillsbury is president.

The Consolidated Cement Corporation, Dwight Building, Kansas City, Mo., has acquired the Great Western Portland Cement Co., Mildred, Kan.; Fredonia Portland Cement Co., Fredonia, Kan.; and Peninsular Portland Cement Co., Cement City, Mich., and will operate under one management. Tentative plans are under consideration for expansion. The Cowham Engineering Co., Chicago, will have supervision over the consolidated organization, of which John L. Senior is president, and Hiram Norcross, vice-president.

The Federal Motor Truck Co., 1800 Park Avenue, St. Louis, has leased a building to be constructed on West Pine Street by the G. T. Burdeau Realty Co., 801 Chestnut Street, estimated to cost $150,000. It will be one-story, 120 x 200 ft., and equipped for a new service, repair and garage building.

The Sand Springs Chemical Co., Tulsa, Okla., is said to be considering plans for extensions and the installation of equipment for the production of calcium chloride, salts and kindred products. Otto Martin heads the company.

The Board of Education, Albion, Neb., will soon begin the construction of a one-story manual arts building, 50 x 90 ft., at the local high school. Plans have been drawn by George Grabe, Columbus, Neb., architect.

The Moloney Electric Co., Seventh and Hickory Streets, St. Louis, manufacturer of transformers, has awarded a general contract to the Hercules Construction Co., Wainwright Building, for the erection of its proposed plant on the Kingshighway, near the Union Boulevard. It will be one, two and three stories, U-shaped, 300 x 750 ft., estimated to cost $700,000 with machinery. The Widmar Engineering Co., Laclede Gas Building, is architect and engineer. The company is a subsidiary of the American Brown Boveri Co., 165 Broadway, New York.

The American Railway Express Co., 1308 Farnam Street, Omaha, Neb., has plans for a two-story and basement automobile service, repair and garage building for company motor trucks, 130 x 132 ft., to cost $50,000 with equipment. Charles Rosenburry, Brandeis Theater Building, is architect.

The City Council, Buffalo, Mo., is asking bids until Aug. 25 for equipment for a municipal waterworks, including one deep well pumping unit, electrically operated, 75-gal. capacity per min. Russell & Axon, McDaniel Building, Springfield, Mo., are engineers.

The Capital Iron Works, Inc., Seventh and Holliday Streets, Topeka, Kan., has awarded a general contract to J. A. Black, Topeka, for its new plant, consisting of structural shop, machine shop and office, estimated to cost $200,000 with equipment. It is also said to be planning the construction of a foundry. R. A. Finney, New England Building, is consulting engineer. H. W. Brooks heads the company.

The Board of Education, Kaw, Okla., has plans for a one-story manual training shop in conjunction with gymnasium building, 54 x 106 ft., for which foundations will soon be laid.

The Missouri Pacific Railroad Co., Railway Exchange Building, St. Louis, will soon begin construction by day labor of proposed additions to its locomotive shops at Nevada, Mo., consisting of an addition to the engine house, new machine shops, boiler house and other structures, to cost $150,000 with equipment.

The Vulcan Mfg. Co., 1511 Cypress Avenue, Kansas City, Mo., manufacturer of iron washers, etc., is considering the erection of a new plant to cost about $35,000. W. C. Bauer is president.

The American Auto & Radio Mfg. Co., 1416 McGee Street, Kansas City, Mo., has been incorporated with capital stock of $500,000 and has succeeded to the business of the American Radio Mfg. Co., and will engage in wholesaling automobile accessories, tires and tubes, and will also manufacture five models of radio receivers. It contemplates turning out 15,000 sets within the next six or eight months.

The Economy Electrical Mfg. Co., Agnes Avenue and Fourteenth Street, Kansas City, Mo., has been incorporated, succeeding a partnership operating under the same name, and will continue to manufacture electrical equipment, such as rectifiers for battery stations and garages, electric welders, spot welders, butt welders, seam welders and a rebabbitting jig for Ford connecting rods and bearings.

The H. C. Atkins Mfg. Co., 2318 Randolph Street, St. Louis, has increased its capital stock to $200,000 to provide for expansion of its business, which consists of manufacturing reamed and chamfered nipples. It began business in 1906 and has had a steady growth. Officers are John W. Gerdel, president and general manager; L. A. Crancer, vice-president and sales manager; and E. E. Gerdel, secretary and treasurer.

Pittsburgh

PITTSBURGH, Aug. 9.

LOCAL machine tool business is feeling the effect of the vacation period, although it compares favorably with the same season in other years. The Westinghouse Electric & Mfg. Co., is still buying against its quarterly list and formal inquiry is expected this week from the Carnegie Steel Co. for a good sized list of tools for its new Houston, Tex., warehouse and fabricating plant. Prices for estimating were taken several weeks ago.

In connection with the recent purchase of the plant and business of the Ridgway Dynamo & Engine Co., Ridgway, Pa., by the Elliott Co., Frick Building, Pittsburgh, the new owner is said to have plans under way for an addition on an adjoining tract, for which negotiations are in progress for early purchase. The Elliott Co. is also understood to be arranging for the immediate closing of its branch plant at Wellsville, N. Y., transferring operations to the Ridgway works.

The Freeman Brick Co., Weirton, W. Va., is said to have tentative plans under way for rebuilding the portion of its plant recently destroyed by fire, with loss approximating $30,000 including equipment.

The Allegheny County Board of Supervisors, Pittsburgh, is completing plans for the early construction of a one- and two-story automobile service, repair and garage building, 65 x 138 ft., for County motor trucks and cars, reported to cost $150,000 with equipment. Stanley L. Roush, 519 Smithfield Street, is architect.

Following its recent purchase of the steam-operated electric-power plant of the Estate of Henry W. Oliver, Pittsburgh, in the basement of the Kauffman & Baer Co. building, the Duquesne Light Co., 435 Sixth Avenue, will make extensions in the power plant of the Allegheny Steam Heating Co., a subsidiary, with the installation of additional machinery to handle the load of the acquired plant, which will be dismantled. The program will require several months for completion and, including plant dismantling, will cost about $2,500,000.

The Corona Coal Co., Hepsibah, near Clarksburg, W. Va., is said to have preliminary plans under advisement for re-

building the portion of its tipple, destroyed by fire July 30, with loss estimated at $50,000 including machinery.

The Fredericktown Coal & Coke Co., Fredericktown, Pa., has secured permission for the construction of a railroad tipple in connection with improvements in its mine tipple and additional equipment installation to adapt the coal-handling plant on the Monongahela River, opposite Martin, Pa., with the new river level at that point.

The Pittsburgh Spring & Steel Co., McCandless Avenue and the Allegheny Valley Railroad, has filed plans for a one-story addition to cost about $16,000.

The South Penn Oil Co., 424 Sixth Avenue, Pittsburgh, has acquired a controlling interest in Pennzoil Co., operating two refineries at Oil City, Pa., and properties in other sections. The new owner will consolidate the interests and has tentative plans for expansion in production and distributing facilities. L. W. Young, Jr., is president.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, will construct a one-story engineering laboratory at its local works, to cost in excess of $50,000 with equipment.

South Atlantic States

BALTIMORE, Aug. 9.

CONTRACT has been let by the Wood Hydraulic Hoist & Body Co., James and Cross Streets, Baltimore, to Otto Randolf, Inc., 53 West Jackson Boulevard, Chicago, for its one-story factory branch, service and sales building, 50 x 120 ft., at Taylor Avenue and Curtain Street, to cost $75,000 with equipment. Headquarters are at 7924 Riopelle Street, Detroit. Logan Wood is vice-president.

The Diamond Ice & Coal Co., Wilmington, Del., will erect a four-story ice-manufacturing plant, 72 x 100 ft., to cost $150,000 with machinery. Brutus Gundlach, 452 Lexington Avenue, New York, is architect.

The Board of District Commissioners, District Building, Washington, is asking bids until Aug. 23 for one gasoline engine-driven portable air compressor, with accessories.

H. C. Davis, Honaker, Va., architect and builder, has been making inquiries for data and prices on domestic electric lighting plants and domestic water plants for isolated service.

Fire, Aug. 3, destroyed a portion of the plant of the Bridges Machine Works, Florence, S. C., with loss in excess of $75,000. It is planned to rebuild.

The Board of Works, Rome, Ga., is said to be planning the installation of pumping equipment in connection with proposed extensions and betterments in the municipal waterworks, for which a bond issue of $70,000 has been authorized.

The South Georgia Power Co., Albany, Ga., will make extensions and improvements in its ice-manufacturing plant at Tifton, Ga., estimated to cost $35,000. Enlargements will also be carried out in the cold storage department.

E. I. du Pont de Nemours & Co., du Pont Building, Wilmington, Del., have acquired more than 1200 acres about 10 miles from Birmingham, and will use a portion of the site for a new plant for the production of high explosives. The project is reported to cost in excess of $750,000. Work will begin in the fall.

Edward P. Phillips, 705 Mutual Building, Richmond, Va., has been inquiring for a crane for use in road-building operations.

The Buncombe County Board of Education, Asheville, S. C., contemplates the installation of manual training equipment in its proposed two-story high school at Swannanoa, S. C., to cost $150,000, for which superstructure will soon begin. W. H. Lord, Swannanoa, is architect.

The Trade School Committee of the Chamber of Commerce, Wilmington, Del., will proceed with the installation of tools and equipment for the new trade school in building heretofore known as school No. 1. Machinery previously used in the high school will be placed in service and other tools purchased.

The A. W. Haas Pattern Co., Atlanta, Ga., manufacturer of metal and wood patterns, has removed its plant to a larger building at 98 Garnett Street where additional facilities will be provided.

The Hackley Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for an 8 x 10 friction hoist, also 7 x 10 similar hoist, each with or without boiler; for a chip mill for stone-cutting, to reduce material from 4 and 5-in. sizes to ¾ and ½-in. and for two watertube boilers, each 300 to 350-hp. capacity.

The Board of District Commissioners, District Building, Washington, is said to be planning the installation of manual training equipment in the proposed two-story and basement addition to the Langley junior high school, Seventh Street, N. E., near Pennsylvania Avenue, to cost $400,000. A. L. Harris is architect for the commissioners.

The American Gas & Electric Co., 30 Church Street, New York, is said to be planning extensions and improvements in the vicinity of Gate City, Va., where the property of the Gate City Light & Power Co. was recently acquired. The expansion will include transmission line construction.

The Common Council, Laurens, S. C., is considering the installation of pumping equipment in connection with proposed extensions and improvements in the municipal waterworks for which a bond issue of $80,000 is being arranged.

The J. H. Marsteller Co., Inc., Memorial Bridge, Roanoke, Va., operating a marble and granite plant, has been making inquiries for a carborundum machine for finishing service.

The Pender County Board of Education, Burgaw, N. C., is considering the installation of manual training equipment in its proposed new high school to cost $120,000, for which plans will be drawn by L. N. Boney, Murchison Bank Building, Wilmington, N. C., architect.

The Southeastern Chemical Co., Valdosta, Ga., recently formed with a capital of $2,500,000, has acquired the local mill of the Georgia Fertilizer & Oil Co., and will remodel and install additional equipment to cost about $25,000. The company is negotiating for the acquisition of additional plants of this character, all of which will be utilized for fertilizer production. William Murphey is one of the heads of the Southeastern company.

George H. Fincher, Fort Valley, Ga., has inquiries out for tools and equipment for drilling wells by the rotary process. Pumping equipment will be purchased later.

The National Safety Appliances Corporation, Hearn Building, Baltimore, has been incorporated to manufacture patented safety devices. It will shortly increase its capitalization and build a factory where all of its products can be made under one roof. At present the company is in the market for bronze and malleable iron castings, also stock hardware, such as snap hooks, patent expansions, screws, eyebolts, etc. Walter A. Hearn is president.

Gulf States

BIRMINGHAM, Aug. 9.

PLANS are being considered by the Great Southern Lumber Co., Bogalusa, La., for rebuilding its mill and box-manufacturing plant recently destroyed by fire, with loss in excess of $500,000 including machinery. It has been giving employment to about 400 men.

The City Council, Harlingen, Tex., has plans under way for extensions and improvements in the municipal electric power house, to include the installation of a 750-hp. generator and accessory apparatus.

The State Board of Control, Austin, Tex., is considering an appropriation of $100,000 for the construction of a new engineering and mechanical building at the North Texas Junior Agricultural College, Arlington.

The Florida Power & Light Co., Miami, Fla., is arranging an expansion program for its ice-manufacturing and cold storage plants, to cost about $1,500,000 with machinery. Early work will include a new two-story ice plant at St. Augustine, Fla., 30 x 100 ft., to cost $100,000 and a similar plant on the Dixie Highway, Melbourne, Fla., to cost approximately $150,000 with equipment. Joseph H. Gill is vice-president and general manager.

The Board of Education, Anniston, Ala., is considering the establishment of a manual training department at the high school, with initial installation to cost about $22,000.

The City Council, Daytona Beach, Fla., plans the installation of pumping equipment in connection with proposed extensions and betterments in the municipal waterworks to cost $100,000. A bond issue is being arranged. Walter A. Richards is city manager.

Fire, July 31, destroyed a portion of the plant of the Arkansas Compress Co., Harlingen, Tex., with loss reported at $450,000 including machinery and stock. Tentative plans are under way for rebuilding.

The Texas Salt Co., First National Bank Building, Houston, Tex., has plans for a new evaporating plant at its salt mines, 60 x 360 ft. Work is under way on a new grainer plant at the mines, with initial capacity of about 40 tons per day. George Leland is president.

The Common Council, Rochester, Tex., will install electrically-operated pumping equipment in connection with a

proposed municipal waterworks to cost $75,000. The Utilities Engineering Co., Wichita Falls, Tex., is engineer.

The American Ice Co., 3307 Lemmon Avenue, Dallas, Tex., will erect a new plant at location noted, to replace a structure recently destroyed by fire. It will be larger than the previous plant, with machinery installation to provide for an output of 80 tons per day. All machinery will be electrically operated. The complete project will cost $150,000 with equipment.

The International Great Northern Railway Co., Union Station, Houston, Tex., has plans for extensions in its locomotive repair shops at Palestine, Tex., consisting of enlargement of engine house, machine shops and other buildings, to cost $85,000 with equipment. C. S. Kirkpatrick is chief engineer.

In connection with a new textile mill project, now under way, the Marble Falls Textile Mills, Inc., Marble Falls, Tex., plans the early construction of a dam on the Colorado River for hydroelectric power for service at the mill, reported to cost in excess of $85,000.

The Board of Aldermen, Franklin, La., is asking bids until Sept. 1 for equipment for waterworks' extension and improvement, including lake pumping machinery, fire pumping equipment, booster pumping station, valves, etc., and electric power transmission line. Henry A. Mentz and James M. Fourmy, Hammond, La., are associate engineers.

The White City Ice & Laundry Co., 21 S. W. Second Avenue, Coral Gables, Fla., will soon begin the construction of a new eight-story cold storage and refrigerating plant, 100 x 150 ft., to cost in excess of $250,000 including equipment. The company plans the erection of an ice-manufacturing plant, as well as mechanical laundry works later. John and Coulton Skinner, News Tower, are architects.

The City Council, Palmetto, Fla., is considering the installation of a municipal electric lighting plant for the street-lighting system.

The Texas Co., Houston, Tex., is negotiating for the purchase of the plants and property of the Crown Central Petroleum Corporation, operating in Texas, Oklahoma, Kansas, Louisiana and Arkansas, with two main refineries on the Houston ship channel, Houston, and at Clarendon, Pa. The company was previously known as the White Oil Corporation. The purchasing company plans extensions in the existing property. Headquarters are maintained at 17 Battery Place.

The Val Verde Industries, Val Verde, Tex., will soon begin the erection of a one-story cold storage and refrigerating plant, to cost approximately $150,000 with equipment.

The Texas Power Co., Seguin, Tex., recently organized, has plans under way for a proposed hydroelectric generating plant on the Guadalupe River, vicinity of New Braunfels, Tex., to cost close to $1,000,000 with transmission system. F. H. Wilmont, Seguin, is president.

The Emsco Derrick & Equipment Co. of Texas, Houston, Tex., has been incorporated and has engaged in the manufacture of steel derricks; also steel band wheels, bull wheels and calf wheels. It is occupying a newly-built plant and is not in the market at present for any additional equipment or material.

Pacific Coast

SAN FRANCISCO, Aug. 4.

PLANS are being arranged by the Union Iron Works, 5125 Santa Fe Avenue, Los Angeles, for the erection of a new branch plant in the Maywood-Bell industrial district, Maywood. The main unit will be one-story, 150 x 450 ft. Electric traveling cranes will be installed.

The Washington Union High School District, Centerville, Cal., has plans for a one-story vocational shop at the local high school, estimated to cost $28,000. Henry H. Meyers, Kohl Building, San Francisco, is architect.

The Advance Auto Body Works, Los Angeles, have plans nearing completion for a new plant at Mission Road and Macy Street, one-story, sawtooth roof type, totaling about 30,000 sq. ft. of floor area. L. L. Jones, Grosse Building, is architect.

The Richfield Oil Co. of California, Inc., Los Angeles, recently formed under Delaware laws with a capital of $60,000,000 by officials of the United Oil Co., Los Angeles, will take over and consolidate a number of petroleum interests in this section, including the United company and its subsidiary, the Richfield Oil Co. Tentative plans are under way for expansion.

The Bunker Hill Mining Co., Tombstone, Ariz., has plans for a new concentration mill, to cost about $100,000 with machinery. Frank S. Morgan is superintendent.

The Ewauna Box Co., Klamath Falls, Ore., manufacturer of wooden boxes and cases, is said to have plans for extensions and the installation of additional equipment. A bond issue to total about $500,000 is being arranged, a portion of the fund to be used for the expansion.

The Home Ice Co., Long Beach, Cal., is having plans prepared for a five-story cold storage and refrigerating plant 75 x 135 ft., to cost about $125,000 with equipment. Paul J. Duncan, Pacific National Bank Building, Los Angeles, is architect.

The Ford Motor Co., Detroit, is said to have plans for the erection of a branch assembling plant at Long Beach, Cal., recently acquired. The initial works are expected to cost in excess of $200,000.

The Longview Fibre Co., Longview, Wash., has acquired about 180 acres along the Columbia River, and has plans under way for a new paper and fibre mill, to cost in excess of $1,200,000 including machinery. All equipment will be electrically operated. Officials of the new company will include M. E. Wertheimer, president, American Lakes Paper Co., and the Thilmany Pulp & Paper Co., Kaukauna, Wis.; and D. C. Everest, secretary and general manager, Marathon Paper Mills, Rothschild, Wis.

The Board of City Trustees, Shafter, Cal., plans the installation of deepwell pumping equipment in connection with a new waterworks system, for which a bond issue has been arranged. A 50,000-gal. capacity steel tank on 75-ft. tower will also be installed. E. O. Wallace is engineer.

The Henry Decorative Stone Co., 631 West Washington Street, Los Angeles, has acquired property at Glendale, as a site for a new plant to cost in excess of $40,000 including equipment.

The Royse-Hankis Lumber Co., Sedro-Woolley, Wash., will rebuild the portion of its plant destroyed by fire July 28, with loss estimated at close to $75,000 including machinery.

A warehouse has been opened at Sixth Avenue South and Connecticut Street, Seattle, Wash., by the Columbia Steel Corporation, San Francisco. For the present the principal items to be carried in stock will be sheets and wire products, which the Columbia Steel Corporation produces at its mills at Pittsburg, Cal.

The Disappearing Roller Screen Co., 1256 Temple Street, Los Angeles, has been incorporated with capital stock of $100,000. It has been engaged in manufacturing roller screens for 16 years but has been operated as a partnership.

Canada

TORONTO, Aug. 9.

A MODERATELY active demand for machine tools is reported for the past week, with inquiries also appearing in good number. The automotive industry continues to furnish the greater part of the present business, while orders for replacement are also being received from the railroads for car shop equipment. A brisk demand is noted for pulp and paper mill machinery and for electric power plant equipment. Second-hand tools have also shown improvement, sales being much in excess of those at this period a year ago. A strong demand is also reported here for small tools.

The Dominion Tar & Chemical Co., Wilde Avenue, Sault Ste. Marie, Ont., will build a distilling plant to cost between $40,000 and $60,000, and is interested in complete equipment.

The Massey-Harris Co., Ltd., 915 King Street, West Toronto, has let the general contract to the Britnell Contracting Co., 903 Yonge Street, for a $70,000 addition to its plant for the manufacture of agricultural implements.

The Newton Dakin Construction Co., Ltd., 181 King Street, Sherbrooke, Que., has been awarded the general contract for the erection of a $350,000 electric power plant on Harrison Lake, at Maccan, N. S., for the Canada Electric Co.

The Canadian Industrial Alcohol Co., Corbyville, Ont., has let the general contract to J. J. McNab, Trenton, Ont., for the construction of a $50,000 pump house.

The Leaside Brick & Land Co., Ltd., Leaside, Ont., will build a plant at a cost of $70,000 to replace one recently destroyed by fire.

Western Canada

The Western Boxes, Ltd., care of H. H. Gillingham, architect, 57 Davis Chambers, Vancouver, B. C., will build a box factory on the Industrial Reserve, False Creek, B. C., to cost $25,000.

The Dominion Wheel & Foundries, Ltd., Archibald Street, St. Boniface, Man., has let the general contract to F. Wyndels Co., Ltd., 155 Bristol Avenue, Norwood, Man., for the erection of a $20,000 foundry addition.

Foreign

THE municipal government at Hamburg, Germany, has approved an appropriation of about $4,710,000 for local harbor improvements, including the construction of a new basin on Waltershof Island, with cranes and other equipment to handle bulk cargo; and a new shed on the Ross Quay, with hoisting, conveying and other handling equipment. The American Consulate, Hamburg, L. C. Morse, assistant trade commissioner, has information regarding the project.

The Havana Electric Railway, Light & Power Co., Havana, Cuba, has arranged for a merger with the Cuban Utilities Co., operating at Santiago, Camaguey and vicinity. Plans are under way for extensions in both properties.

John N. Willys, president, Willys-Overland Co., Toledo, Ohio, and Willys-Overland Crossley, Ltd., London, a British subsidiary, is reported to be negotiating for the purchase of property at Wembley, near the London city limits, as a site for an automobile plant. The property is said to be held in excess of $1,000,000, and the projected plant will cost close to a like sum. Mr. Willys is now on a trip abroad.

The Union Oil Co. of California, Union Oil Building, Los Angeles, has entered into agreement with the Maxudian Petroleum Corporation of Venezuela, to develop about 25,000 acres of proved ground on the latter's concession in the Paez district, vicinity of Lake Maracaibo, including the installation of rigs and drilling machinery and tools, with storage and distributing facilities.

The International Standard Electric Corporation, 41 Broad Street, New York, manufacturing subsidiary of the International Telegraph & Telephone Corporation, same address, has secured an order from the Italian Government for underground cables and equipment for connection between important cities of the country. The contract is said to total about $20,000,000.

Preliminary plans are under way for the construction of an artificial gas generating plant in one of the large cities of Switzerland to cost in excess of $2,000,000 with machinery. It will be equipped for an initial output of 150,000 cu. meters per day of 24 hours. Information at the office of the Bureau of Foreign and Domestic Commerce, Washington, reference No. 215422; also at the American Consulate, Basel, Switzerland, Charles W. Allen, vice-consul.

New Trade Publications

Gasoline Power Units.—Climax Engineering Co., Clinton, Iowa. Bulletin E of 12 pages describes various models of portable and stationary types of gasoline engines for connection by belt or otherwise to the driven unit. The models shown are listed from 57 to 142 hp., at 1200 r.p.m. Specifications and dimensions are given.

Flush Valves.—Bridgeport Brass Co., Bridgeport, Conn. Bulletin No. 24, describing the company's three types of valves designed for plumbing fixtures. All data, including assembling, operation and servicing, are furnished.

Air Filters.—Staynew Filter Corporation, Rochester, N. Y. Illustrated catalog of 16 pages, describing the company's Protectomotor industrial air filters. They are adapted to a wide range of industrial, mining and engineering service and range in capacity from 15 to 5000 cu. ft. per min.

THE LAST WORD

(Contributed by the Reader Service Department of the Iron Age Publishing Co.)

Note: Many IRON AGE subscribers have the paper forwarded to their vacation address.
Scene: Lake Peesaguttapercha, Maine. Two men in a rowboat. Both fishing and one reading THE IRON AGE.

Fisherman No. 1.: "Verily, this is the life. One four-pounder and my cup of happiness will be full to overflowing."

Fisherman No. 2.: "I see pig iron output fell off only 3.6 per cent in July. Pretty good."

F. 1 gets a strike. Excitedly he begins to play the fish, registering tensely, "Look at him! A big fellow!"

F. 2.: "Well, well, well. Here's a surprise for you. They've made old Johnjones a vice-president. 'Bout time."

F. 1.: "Get the net! Get the net!"

F. 2.: "Hardly any change in prices. Things look pretty stable."

F. 1. is just two jumps ahead of apoplexy. The pickerel is making a game fight, but due to F. 2's absorption it might get away.

"GRAB THAT NET!"

But just at that moment F. 2 is concentrated on a little item about a new case-hardening process. Then things begin to happen. F. 1, trembling with excitement, reels in fast, gets the fish over the side of the boat. Flop! goes the fish off the hook, and lands on the boat bottom.

F. 2, aroused at that by the commotion, takes in the scene with a single glance, and just as the fish is about to flip itself back into the lake he saves the day by hitting it on the head with THE IRON AGE.

All of which goes to show that you can never tell when a business paper will come in handy.

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JUST an hour before this was written a letter arrived from Sarajevo, Serbia, that town of fateful memory. "Send us at once the Oct. 21, 1915, issue," it read. What they want it for, we weren't told.

In the same mail a Boston engineer hopefully inquires, "Can you supply Nos. 8 to 12 of the first half of 1909?" Another says, "Send us No. 19 of the last half of 1903." Every day they come in.

Which brings up the question, "If yesterday's newspaper is as dead as Cleopatra, what is the life of last week's trade paper?" Our guess is that it will live at least until Aug. 12, 1950, if it happens to have an editor with an eye for long-lived articles.

Old copies of THE IRON AGE are as scarce as razors were in the gay sixties. An article of exceptional interest may cause an entire issue to be exhausted within a few weeks. Better save your old copies. They are hard to replace. Right now the Committee on Economic Research, Harvard University, Cambridge, Mass., wants complete volumes of years previous to 1919. If you have any to sell, write to the librarian.

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The American is a master in the handling of employees and workmen, and the natural, yet respectful, conduct between superior and employee stands out favorably when compared with European practice.

—From Friedrich von Muenzinger's address delivered before the German Society of Engineers (THE IRON AGE, Aug. 5, page 346.)

What American manufacturer will not blushingly admit the truth of this statement? A. H. D.